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THE IRON AGE

THE NATIONAL METALWORKING WEEKLY April 13, 1950

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I PUMP AND CIRCULATE THE OIL I NEED
I REDUCE "FLASH" FIRES IN TREADLE ROLLS
FILTER AND STORE THE OIL I USE
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Next month at Atlantic City the textile industry stages its National Show.

Here are six ball bearings originated and developed by New Departure for that industry.

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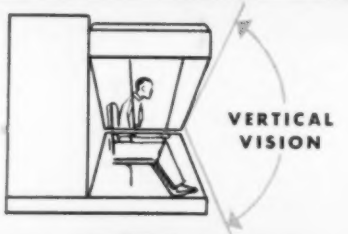

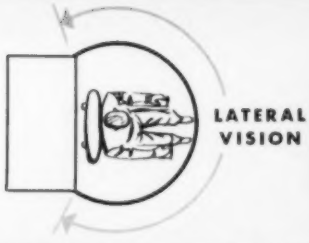

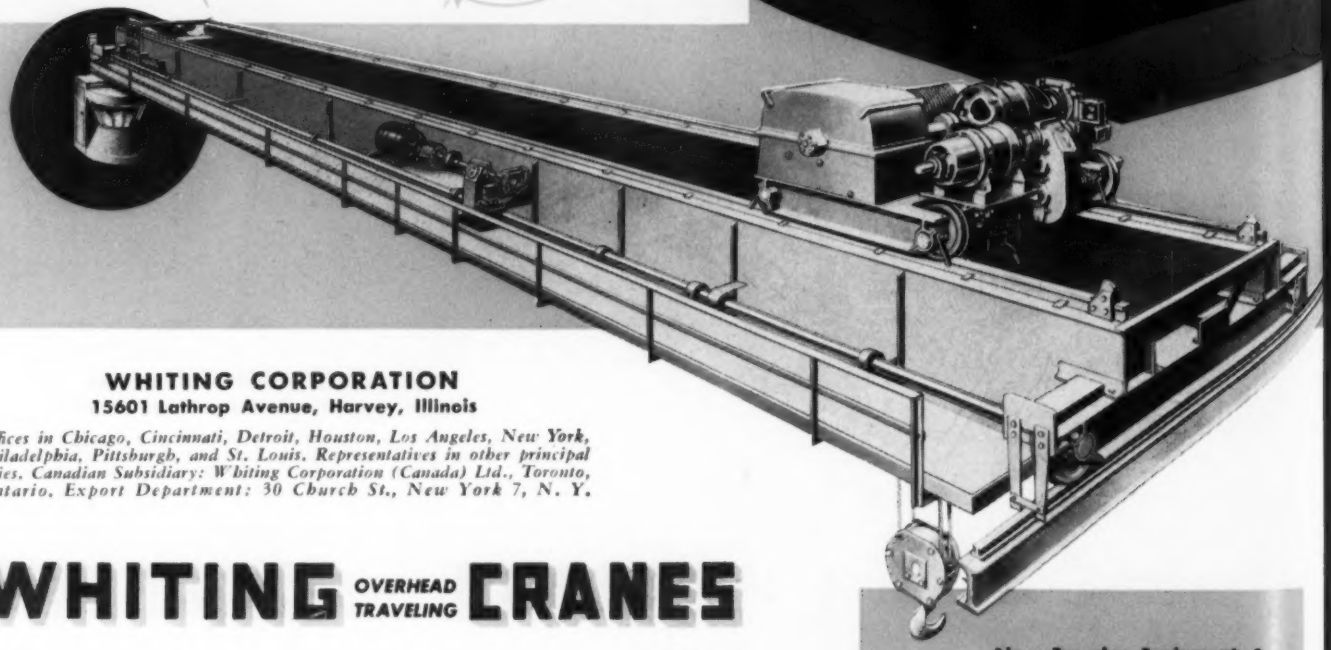

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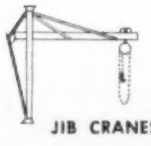
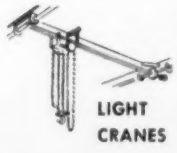

JIB CRANES

TRAMBEAM SYSTEMS


LIGHT CRANES

Also: Foundry Equipment • Railroad Equipment • Metal-Working Machinery • Swenson Evaporators and Spray Dryers • Food Freezers

FABRICATING MACHINE PARTS?

Use Weldments

Fabricated by Bethlehem, this welded frame for a 275-ton flanging press weighs 77,465 lb. It is 12 ft 10 in. high, 12 ft 7 in. deep, and 60 in. wide.

By using Bethlehem Weldments in the fabrication of machine parts, you can be sure of getting welded units which are not only strong, but also economical.

Bethlehem Weldments consist of formed and flame-cut rolled-steel plates and structural shapes which are accurately welded into assemblies. If desired, Bethlehem Weldments can be combined economically with steel castings or forgings.

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THE IRON AGE

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APRIL 13, 1950 • • • VOL. 165, NO. 15

Special Article

A complete study of sonic testing techniques on heavy forgings is presented in this issue in pictorial form. Oscilloscope photos reveal all types of common defects. Heppenstall's 3 years of experience show the value of sonic testing in making quality forgings.—p. 77.

Issue Highlights

The formation of galvanizer's dross is eliminated in a new induction heated, refractory lined galvanizing furnace. Close temperature control, absence of fumes, higher quality surface finish, and cheaper coating make this furnace a major contribution to the hot dip galvanizing industry.—p. 93.

A quick statistical quality control method uses multiple correlation on routine tests to analyze the effects of materials and methods in pipe production. Proper correlation of three variables—carbon, manganese, and wall thickness—allows accurate control of quality.—p. 82.

Auto executives who like to play with figures have been juggling them in an interesting way, spelling out a 7 million car production year. Few of them really believe that they can make it this year, because there are several realistic factors which point the other way. But they are still going to give it a real battle.—p. 99.

Some relief for the linepipe shortage is on the way. Two large new electric weld pipe mills were brought into production last week by U. S. Steel subsidiaries. Each mill has an annual capacity of 100,000 tons of pipe a year. Together they are capable of turning out 1200 miles of 30-in. diam pipe a year.—p. 102.

THE IRON AGE financial analysis of 1949 covering 26 steel companies with 92 pct of the industry's ingot capacity appears in this issue on page 106. It shows net earnings of these companies off only 2.3 pct, despite the pension strike last fall. All figures are compared with the previous year for your convenience.—p. 106.

Coming Next Week

THE IRON AGE special Metal Powder Issue is devoted to the latest developments in powder metallurgy. Included are articles on: (1) Powder parts made with interior cavities that serve as oil reservoirs; (2) parts manufactured to close tolerances requiring no further machining, and (3) the successful plating and pickling of powder parts.

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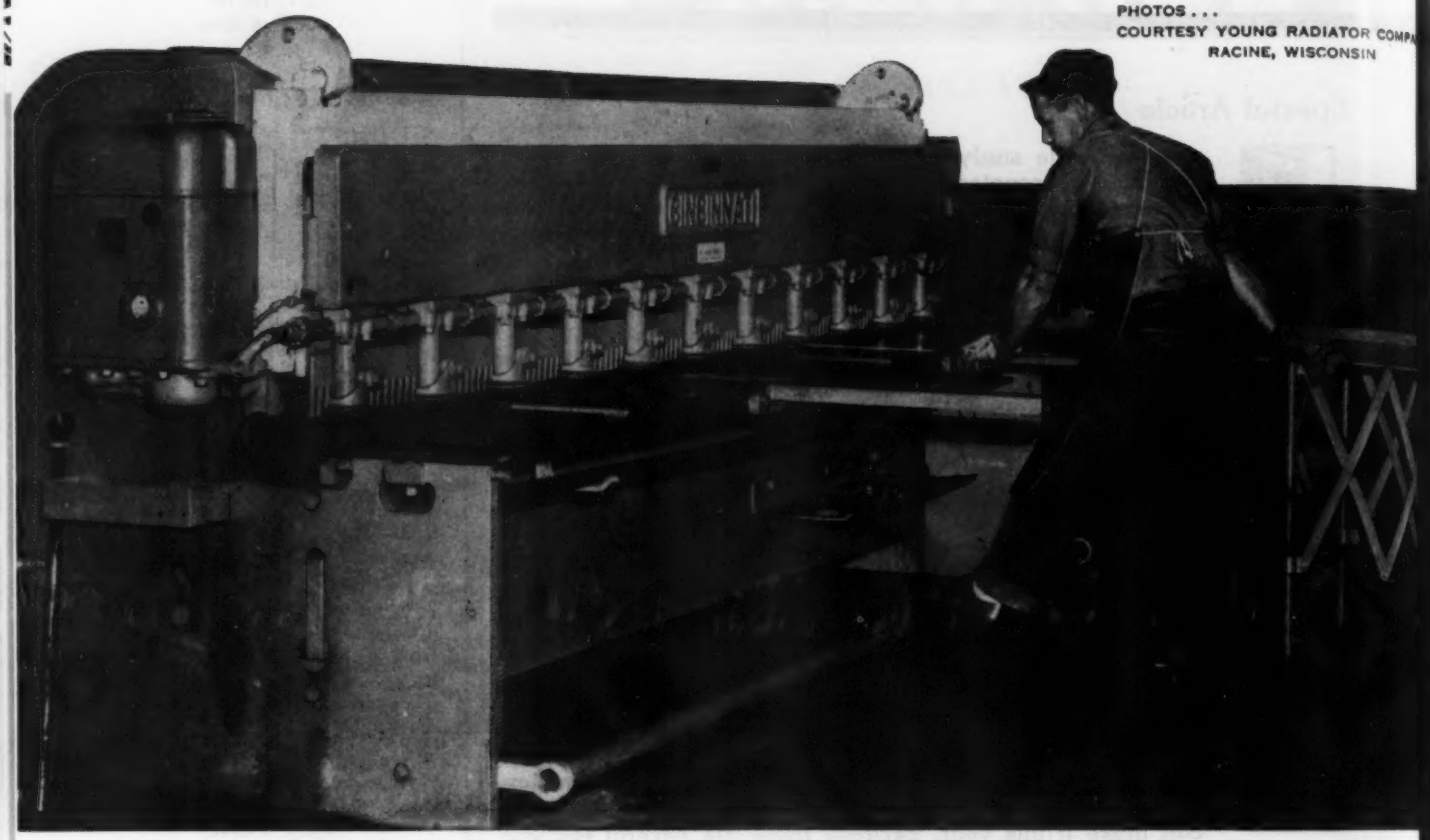


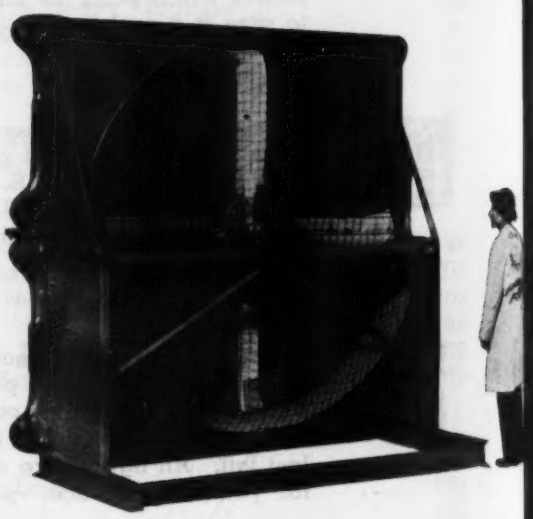
PHOTOS . . .
COURTESY YOUNG RADIATOR COMPA
RACINE, WISCONSIN

All the steel parts requiring shearing operations on these engine jacket water coolers are handled by Cincinnati Shears.

The rapid stroking and gauging of Cincinnati Shears save time, and the square corners and straight edges of blanks produced on Cincinnati Shears cut assembly costs and speed production.

For best results, consult our Engineering Department. We will gladly cooperate with you on your shearing needs.

Write for Catalog S-5 for a description of the complete line of powerful, speedy, all-steel Cincinnati Shears.



The Young-Happy Full Flow Engine Jacket Water Cooler with 93" variable pitch fan.

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SHAPERS · SHEARS · BRAKES

Editorial

INDUSTRY VIEWPOINTS

Who Made The Fast Buck?

BEHIND all the persecution of the steel industry is the idea that companies charge all the traffic will bear. If they are not accused of that, people are told steel officials have no social conscience. At times they are even charged with having no conscience at all.

Let's look at the record. These are the days when the one who lets fly first gets the biggest audience: the times when a man who tries to defend himself or his company finds the bricks coming too fast.

But just for fun: What happened during the war? Did steel people gouge the country? Did they gouge the government? Did they gouge their customers who had contracts for war material? They did not!

No matter what attempts were made to try to pin the donkey's tail on steel people during the war the pinners missed completely. No evidence was dug up that regular steel firms who had been doing business for years did anything but get the steel out quickly and cheaply.

Okay. Let's turn to peacetime. Did the steel industry try to gouge its customers when the war ended? They did not. Did steel leaders have a social conscience during the extra tight supply conditions? They did. How do we know?

We know because IRON AGE editors made it their business to cover every steel center and steel consuming center to get the facts. What were the facts?

The facts were that steel firms in their effort to keep from becoming involved in a gigantic inflation with its subsequent collapse went out of their way to keep prices from running wild.

What can you believe when you know that steel firms saw a gray market with premiums of $100 to $200 a ton flourish and did their best to break it—while their own prices were at published levels? The fast buck during the hectic days of steel shortages was not made by steel firms.

What can you believe about steel leaders when you know that many outlandish conversion deals which involved hundreds of dollars a ton saw no regular steel company in on the "take"? They sold at regular prices.

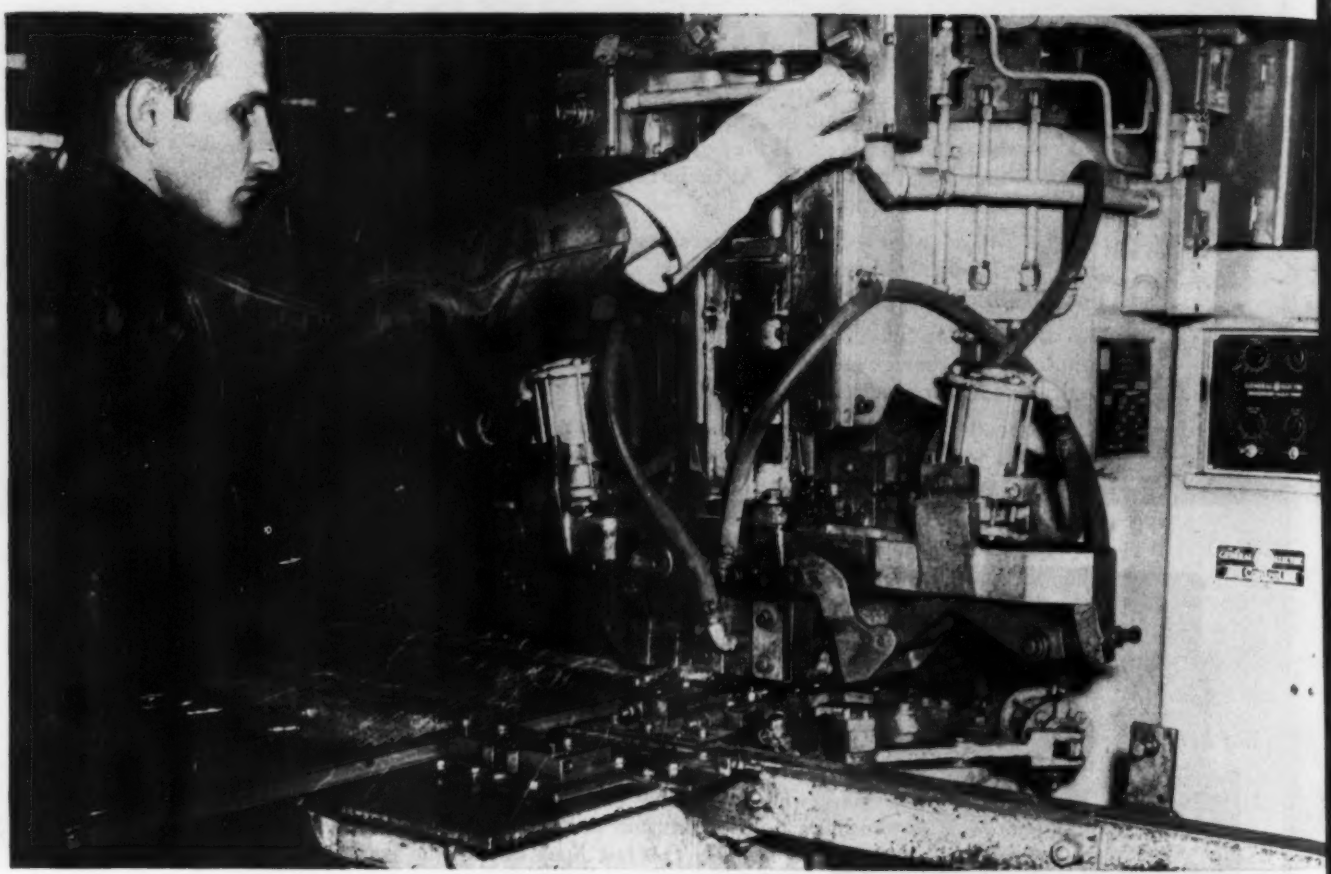
Do the steel firms gouge the public? Lack a conscience? Of course not! And do you think that under government control any better can be done? Controls, via the back door under another name threaten this industry. Don't let it happen.

Tom C. Campbell

Editor

G-E NONSYNCHRONOUS

Better than ever



All the control you need—including accessories—is contained in the modern attractive cabinet. Combines all the advantages of standard components with the specialized details and refinements required for your work. Nonsynchronous control is commonly required for welding standard steels such as are used for automobile bodies, stoves, furnaces, refrigerators, motors, etc. Here it is used for welding hinges to a steel window frame at Copco Steel and Engineering Company, Detroit, Michigan.

GENERAL ELECTRIC

NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► Stainless steel powdered metal filters are now being used in tubular form, 48 in. long. The tubes are fabricated from 3¼-in. diam units. The filter separates particles 10 to 100 microns in size.

► An eastern foundry is replacing large wooden core boxes with cast aluminum boxes following development of a new way of casting the thin walled boxes. The new product costs less than wooden boxes and has other advantages—among them that it can be put in an oven to dry without risk of warpage.

► The present demand for automobiles is being justified by auto industry economists on the basis of filling basic transportation needs. But some statisticians estimate that the appliance industry is currently running 80 pct ahead of anticipated sales. Their question is: Was the sales estimate wrong or is appliance demand likely to slip in a hurry?

► The group planning to convert the wartime brass shell casing plant in Chicago into a steel strip rolling mill apparently now has its financing lined up. But—like some old line non integrated mills—they are reportedly having serious trouble assuring themselves of a steel supply. Informed sources predict that within 6 weeks the mill will either be ready to roll or plans will be called off.

► One well informed analyst in the electrical power industry estimates that while the reserve of generating capacity over demand may reach 15 to 18 pct within the next 4 years the demand trend is still rising so fast that installed capacity in 1960 may have to be double that available at the end of 1947.

► A trend to watch in the auto industry is the growing use of die castings. First came hardware, then grilles. Now the demand for die cast automatic transmission parts is snowballing.

This year will see a real effort to redesign many auto parts to cut material and manufacturing costs, particularly in the lower priced lines.

► Operators of underground metal and limestone mines are taking a cue from the coal people by installing mechanical loading and handling equipment to boost production and hold down costs. The coal type equipment has been beefed up to meet tougher mining conditions.

► Although steel shipments last year were smaller than they were in 1948, output of some products rose considerably. Biggest gains were scored in galvanized sheets, cold-rolled sheets and pipe. Sure enough, they are still the steel items in tightest supply—and in the same order.

► The soil pipe industry probably set some kind of a record in its big and sudden switchover from 40-lb to 35-lb pipe. Some foundries changed overnight when one big seller issued a price list on the lighter and less expensive product. It is a return to prewar practice which had to be dropped when iron quality fell during the war and necessitated the heavier pipe.

Designed for

Continuous Operation

THE NEW HARRIS PRESS

BOTTOM DROP-OUT FOR BALES SPEEDS PRODUCTION—This revolutionary design is a great time saver and profit maker. While the compression chamber is baling, the charging chamber is receiving a new load. No bale is too large to come out of the new, speedy, bottom drop-out. This new Harris Press is of exceptionally sturdy construction from plates and structural shapes instead of the usual heavy castings. Both rivet and electric weld methods of construction are used. The Harris 4-A-BD Baling Press is designed and constructed to withstand far more strain than the safety valves of the power system will allow to be applied.

GENERAL SPECIFICATIONS

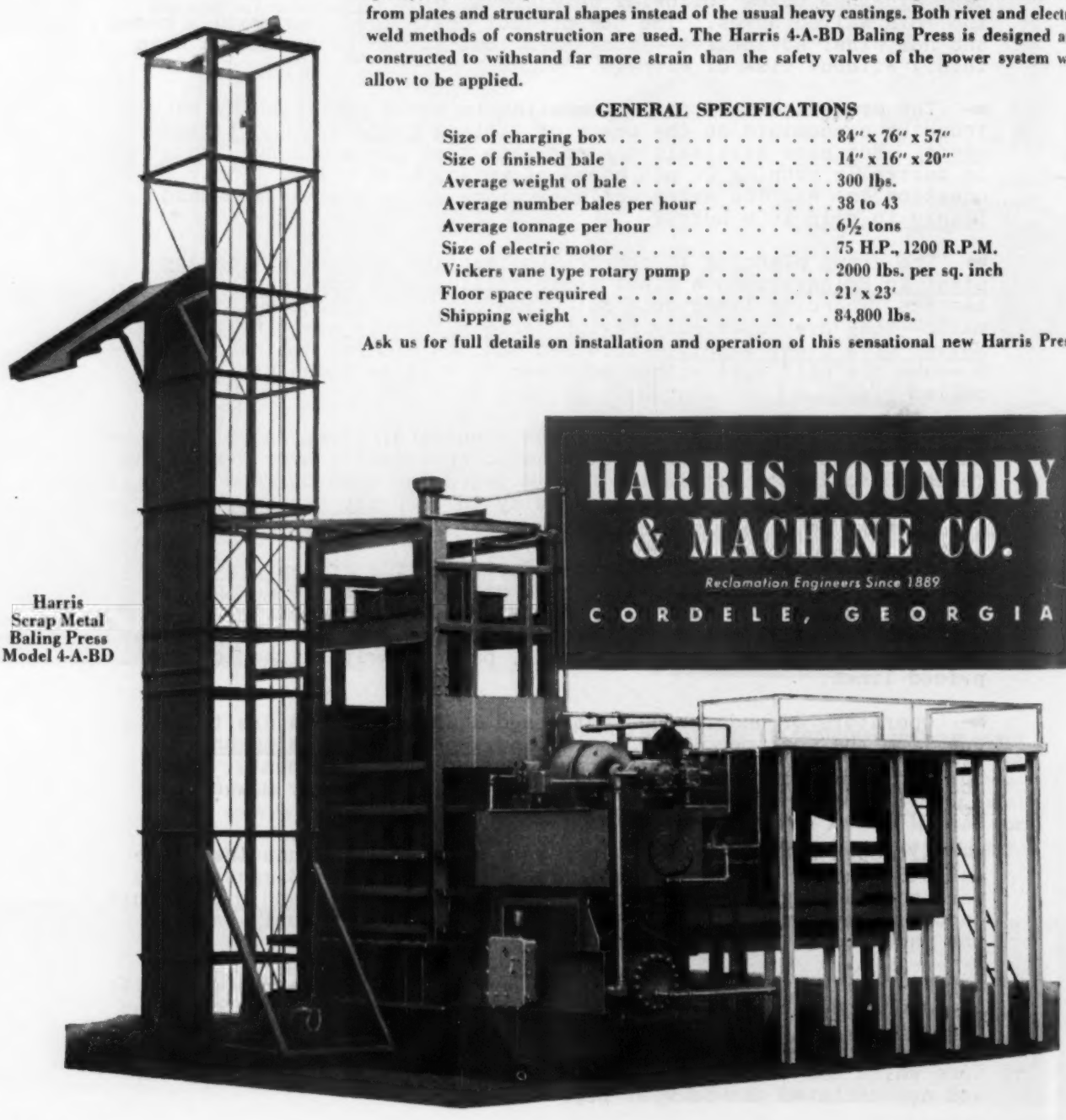
Size of charging box	84" x 76" x 57"
Size of finished bale	14" x 16" x 20"
Average weight of bale	300 lbs.
Average number bales per hour	38 to 43
Average tonnage per hour	6½ tons
Size of electric motor	75 H.P., 1200 R.P.M.
Vickers vane type rotary pump	2000 lbs. per sq. inch
Floor space required	21' x 23'
Shipping weight	84,800 lbs.

Ask us for full details on installation and operation of this sensational new Harris Press.

HARRIS FOUNDRY & MACHINE CO.

Reclamation Engineers Since 1889

CORDELE, GEORGIA



Harris Scrap Metal Baling Press Model 4-A-BD

Steel Earns Only 2.3 Less

Consumers Building Inventories

Scrap Markets Are Still Strong

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

THE 1949 earnings of the nation's steel companies fell only 2.3 pct below the 1948 level despite the strike that crippled most of the industry last fall. This is one of the salient conclusions obtained from a financial analysis of the industry just completed by THE IRON AGE. Total income for the industry was $554 million on sales of about $7.7 billion.

The decline in earnings, less proportionately than the 9.2 pct slump in net sales and operating revenue, reflected: (1) The industrys ability to shake off the depressing effect of a month-long shutdown, and (2) increased operating efficiency through modernization and better production planning. The price increase of last December was scarcely felt. Net income was 7.2 pct of sales for 1949, 6.7 pct for 1948, an increase of 7.5 pct.

Indicating the industry's increased awareness that stockholders must receive a good return on their investment if more equity capital is to be attracted to the business, common dividends declared were up 10.3 pct in the face of the decline in earnings. This is in contrast to 1948 when common dividends rose only 7.1 pct despite a 32.4 increase in earnings over 1947.

Part of Output Builds Inventories

Steel shipments declined about 11 pct. Surplus accounts of the 26 companies were up an average of 13.1 pct, while invested capital rose 7.0 pct, and working capital 8.3 pct. Invested capital per ton or ingot capacity was up 4.9 pct.

Steel executives believe that reported net earnings of the companies are overstated, and do not reflect a true picture. They are carrying on a running battle with the Treasury Dept. Over allowance for depreciation. They say it reflects cost of replacement, not original cost as the law is now interpreted. They are hopeful of winning the battle, but prospects for congressional action this year are gloomy at the moment.

This week steel sales executives told THE IRON AGE the level of business is good—much better than they thought it was going to be a few months ago. But even this high level of business is not enough to support the extraordinary rate of steel production we are now witnessing.

They point out that some of the steel now being made is going into depleted inventories. And when these inventories are built up to desired levels there will be a drop in demand—even if industrial activity remains at current levels. But steel operations could slump a long way without alarming steel people. Even a 20 pct drop would leave operations comfortably above the break-even point for most companies.

Conversion Seen in Third Quarter

This week there are still no signs of a slowing of demand. Cancellations are almost unknown, except for some in long range linepipe orders. Some orders for pipe to be delivered as far ahead as 1952 have been cancelled and placed with new units which have recently been brought into production. Linepipe making capacity is still filled practically through 1951.

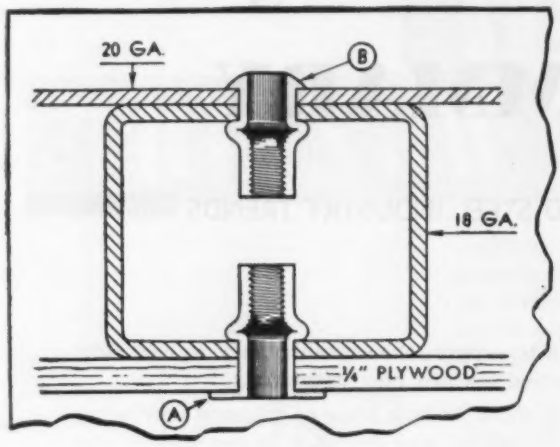
Past reluctance to make third quarter conversion commitments is melting fast. Conversion seems definitely with us in the third quarter, probably in sizable volume. This forecasts a very healthy market—at least up to that point. Original estimates had conversion fading out by the end of the second quarter.

Steelmaking operations this week are scheduled one point higher at 98 pct of rated capacity. They are expected to remain at or near this high level for the next several weeks. This rate of production will yield more than 1,864,000 tons of steel for the week. If maintained for a full year, the total would be about 97 million tons.

Scrap Still Shows Strength

THE IRON AGE steel scrap composite price was unchanged this week at $28.83 per gross ton, the high for the year. The market is still generally quite firm. Price advances were recorded in railroad scrap and secondary grades. Strength in the cast grades indicates an improvement in foundry business.

NEW, BETTER WAY
to fasten plywood to steel

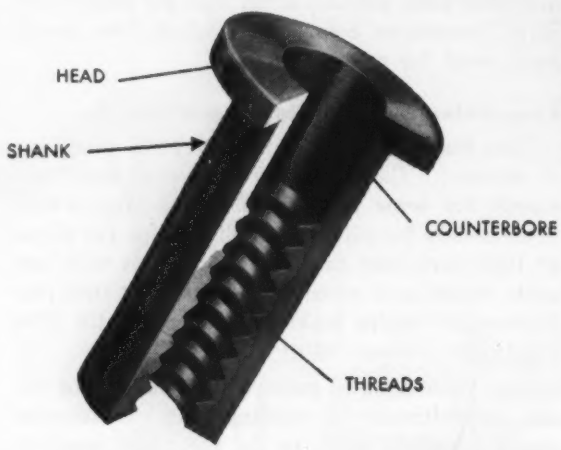


Trailer designers had the problem of securing ¼" plywood walls to 18 gage tubular steel sections with rivets that would not be pulled through the plywood under stress or vibrate loose in service. They found the answer in the new B. F. Goodrich Rivnut with the large washer head.

Washer-head Rivnut "A" is easier to install than either wood screws or self-tapping screws. The plywood can be countersunk so that the head of the Rivnut is flush with the plywood. Rivnuts eliminate the need for wood filler in the tubing. Brazier-head Rivnut "B" fastens either 1 or 2 sheets of 20 gage steel to the opposite side of the section.

Both Rivnuts serve as blind rivets. They can also be used as nut plates for fastening trim strips and other attachments. Because installation is done by one man, from one side of the work, in a few seconds, costs for the whole operation are reduced. If you have a fastening problem, chances are there's a Rivnut that will solve it. Why not get complete information? Write The B. F. Goodrich Company, Dept. IA-40, Akron, Ohio.

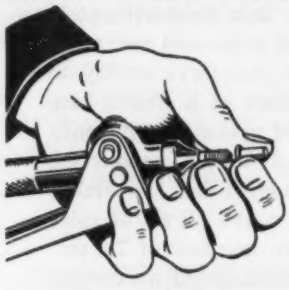
THIS IS A B. F. GOODRICH RIVNUT...THIS IS HOW IT WORKS



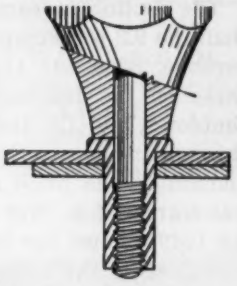
This cross-section shows the threads by which the Rivnut is threaded onto the pull-up stud of the heading tool. These threads are not injured by the heading operation and enable you to fasten *to* a Rivnut as well as *with* it.

Note counterbored portion of Rivnut in which lateral bulge is formed by pull-up action.

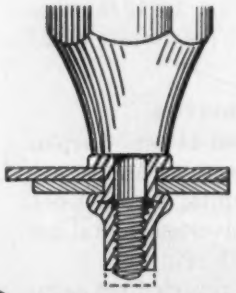
The Rivnut provides a large bearing surface, requires only a small hole, and can be installed after enameling without marring the finish.



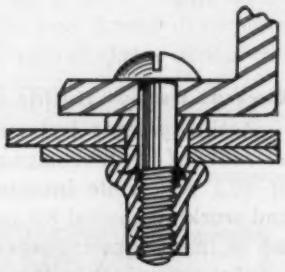
1. Rivnut is threaded onto pull-up stud of a manual or pneumatic heading tool.



2. Rivnut is inserted—head firmly against work, tool at right angles to work.



3. Tool lever operates pull-up stud, forming a bulge in the Rivnut shank.



4. After upset, Rivnut threads are still clean and intact, ready for screw attachment.

B.F.Goodrich

RIVNUTS

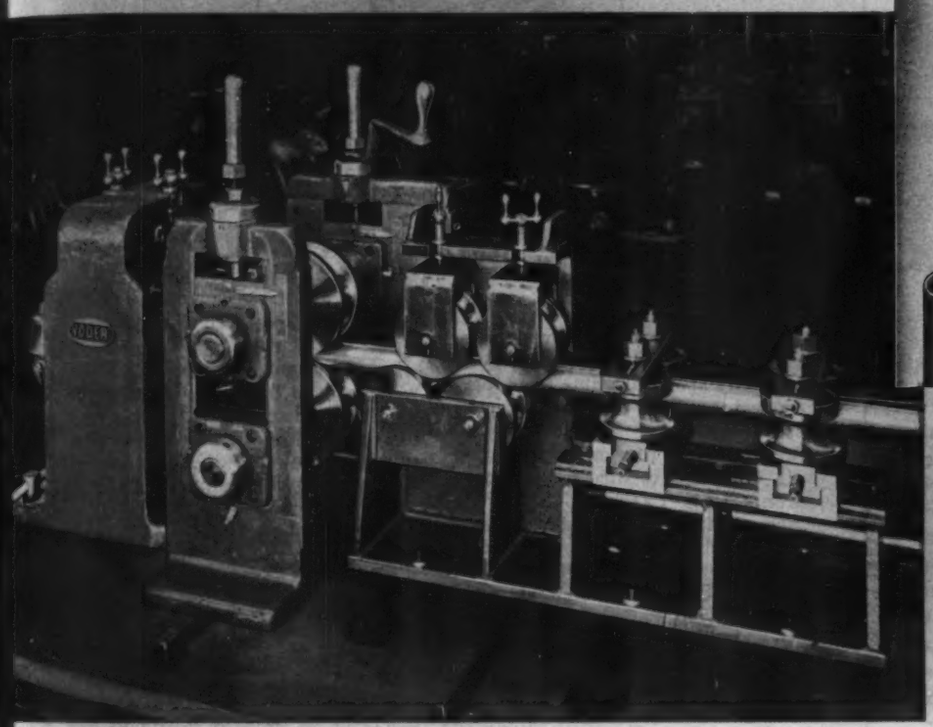
The only one-piece blind rivet with threads

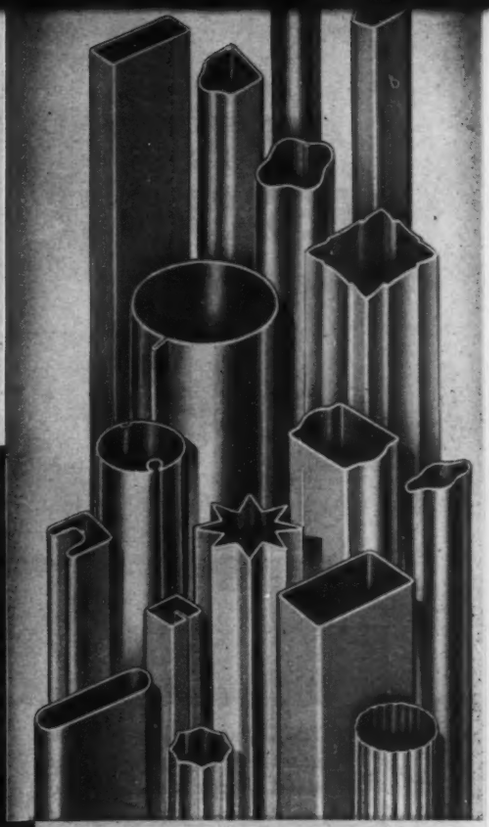
SEND NOW FOR FREE RIVNUT DEMONSTRATOR

Demonstrates with motion how you can use Rivnuts to fasten TO *and* fasten WITH. Explains construction, gives proved applications . . . Write for your free copy today to The B. F. Goodrich Company, Department IA-40, Akron, Ohio.

12 Examples of Economies Effected

by combining different operations in a Yoder Roll-Forming production line





NO. 7

Making Tubular Shapes with many Types of Seams

ONE of the many operations which can be done at the lowest possible cost in a Yoder cold roll forming machine is the making of non-welded tubular shapes, having round, square or other profiles, with edges butting, overlapping, or joined by an interlocking or other type of seam.

In the photo above is shown the series of rolls, mounted next to the exit end of the machine, for folding and joining the edges into the familiar lock seam.

Flat stock, in coils or cut lengths, is automatically fed into the machine at the rate of 30,000 feet or more per day, coming out as finished tubing of almost any desired design, diameter, thickness, and kind of seam, except welded. (For welded pipe and tubing, a Yoder Tube Mill is necessary.)

On the whole, the Yoder method of combining cold roll forming with other operations such as notching, perforating, embossing, welding, inserting paper, felt, etc., injecting adhesives into seams, coiling, curving, ring forming, etc., results in drastic reductions in unit cost compared with any other method available. Hence the strong prevailing trend towards adoption of Yoder equipment to serve any purpose for which it may be applied to advantage. Best known is the making of plain and specially designed structurals, mouldings for decorative trim, panels and hollow sections for use in buildings, toys, vehicles of all types, furniture, fixtures, appliances, etc.

Yoder engineers are at your service in adapting cold roll forming and auxiliary equipment to special production requirements. Literature, recommendations and estimates for the asking.

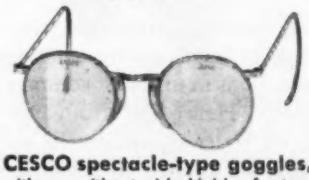
THE YODER COMPANY
5510 WALWORTH AVE. • CLEVELAND 2, OHIO

mplete Production Lines

COLD-ROLL-FORMING and auxiliary machinery
GANG SLITTING LINES for Coils and Sheets
PIPE and TUBE MILLS–cold forming and welding

ENGINEERING YODER MANUFACTURING

CESCO Super-Safety lenses are guaranteed to equal or exceed federal specifications for optical qualities and resistance to impact. In the laboratory, CESCO cup-type safety goggles withstand severe impact tests. On the job, hundreds of thousands of CESCO goggles have proved their strength and quality in use. You find them in plants where safety standards are the highest. Add comfort and durability as additional features of CESCO goggles and you conclude: **For Safety, use CESCO.** Available with clear or filter lenses. Write for catalog showing CESCO's full line of safety goggles.



CESCO spectacle-type goggles, with or without sideshields, feature the exclusive Comfort-Bridge.

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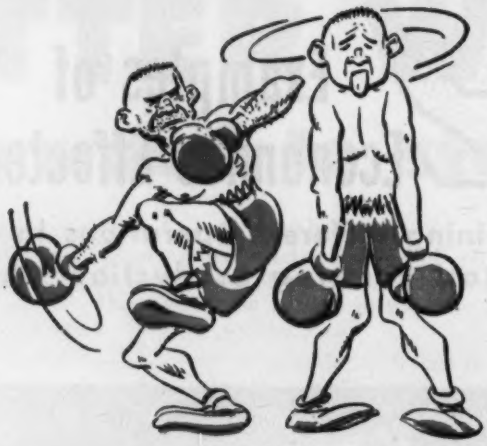
FOR SAFETY



Fatigue Cracks

By Charles T. Post

Ah, Spring!

The ideal director of research, we've always maintained, does not necessarily spend his time thinking up new ideas. He can get further faster by taking someone else's ideas and improving on them.

H. W. Abbott, director of research, Speer Carbon Co., is no slouch at innovations. But wait 'til you hear what he has in mind for the sharply spiked bird guards developed by the Bureau of Reclamation to protect its power line towers. You will recall that a strategically located aluminum pan was included with each bird guard, and that the question was raised as to who climbs the towers to empty the pans (Fatigue Cracks, Mar. 30).

Mr. Abbott has nurtured this seed of an idea to full bloom:

"I may be able to use much the same idea to protect my nice new aluminum garage doors. Starlings and sparrows bed down in the vines and my doors are not so pretty this Spring.

"As a suggestion, why not leave an opening on the windward and also the leeward sides of the aluminum pan? When sufficiently dry, the wind would effectively empty the pans. Flower seeds sown around the base of the towers would soon make a colorful show."

Bureau of Reclamation, please copy!

Backward, Harch!

Charles C. Finn says his car has a "hill-holder" which keeps it from undesired backing on Seattle's many hills, but he's puzzled by your f.f.j.'s description of the new British gas turbine car (Mar. 23, p. 32). "Reverse gear is operated by a normal level," says the article. To us, this makes about as much sense as anything we've read about automobiles powered by gas turbines, atomic energy, or sherry wine. But if it troubles Mr. Finn, we'll explain that this device is designed for backward drivers with forward looking ideas who do their driving in the Rocky Mountains of Kansas. Any other questions?

Puzzlers

As H. Kelsea Moore describes the dilemma of the race track driver who averages 30 mph for the first half lap on a circular mile track and wants to average 60 mph for the full lap: "The total time elapsed for the driver to go around the track at 60 mph would be one minute. His total time for half a mile at 30 mph was one minute, so no matter what his speed was for the last half mile, he still would be over a minute for the full course. Hence it would be impossible for him to average 60 mph for the course."

And to further demonstrate the high caliber of minds which attacked this problem, Ernest E. Thum, editor of our distinguished contemporary, *Metal Progress*, reached the same conclusion as Mr. Moore.

If last week's exercise on the price of eggs gave you any trouble, J. W. Foster, who submitted it, says the answer is 16¢ a dozen. Wait till the Dept. of Agriculture hears about this.

Martin Baron of Sears, Roebuck recalls a classic: A red spot was marked on the foreheads of the three wisest men of the land. Each was told that his spot was either red or green (he could not see which). They were all sent into the same room and each was told to stand if either of the others had a red spot. The first one to tell the color of his own spot would be judged wisest of all. Inasmuch as each saw at least one of the others with a red spot, all stood up. After a moment, one shouted that his spot was red. How did he know?

this seal

means security in shipping

For over thirty years, this red Signode seal has identified the Signode System of Steel Strapping—a method of shipment protection that has been employed profitably by many of the best known manufacturers of iron, steel and related products.

Wherever you see this seal . . . on steel sheet packs, boxes, crates, bundles or massive loads that take up a whole flatcar . . . you see the end result of the most extensive research and development in the steel strapping industry.

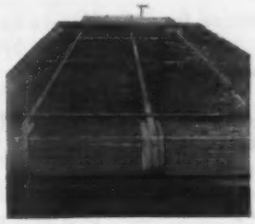
For example, Signode operates the only railroad test-track used exclusively for perfecting methods of bracing freight car shipments. Signode is first to make available to industry fully automatic power machines for applying steel strapping on production lines. Signode maintains a staff of trained engineers *solely* for the benefit of customers, for development work in the field.

Probably most important, however, is the fact that Signode has but one business, one aim —to bring to every shipper, large or small, the cost-cutting, profit-building advantages *inherent* in steel strapping.

Regardless of what, where or how you ship, it will pay you to get the *whole* Signode story. A note on your company letterhead, or a telephone call will assure prompt action.

Safe transit for heavy, yet easily damaged products like die castings, metal furniture, heating equipment.

Secure pilfer-proof packaging for all kinds of containers.



Sure bracing for such hard-to-hold loads as machinery, sheet steel, wire coils.

Simplified handling for small units that lend themselves to palletizing.

SIGNODE STEEL STRAPPING CO.

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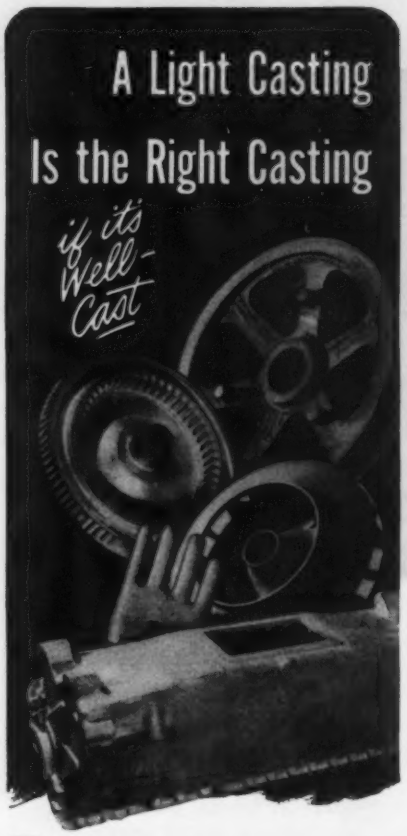

THE right casting for you might be an aircraft part a rubber goods part textile machinery automotive portable tool application implement or vacuum cleaner part.

The right casting might well be a light casting.

There are several good reasons why it *will* be right if it's *Well-Cast*, in either aluminum, magnesium or bronze:

- Our 40 years experience
- 3 complete plants
- A national reputation for good service
- The economy-in-use of light metals
- A long list of satisfied customers
- Facilities to produce sand, semi-permanent or permanent mold castings

Let's hear from you. Tell us your problem and we'll tell you whether a light casting is the right casting. *Catalog No. 50 on request.*

Well-Made Wood and Metal Patterns

THE WELLMAN
Bronze & Aluminum Co.
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CLEVELAND 4, OHIO

Dear Editor

APPRECIATION

Thank you very much for your article "IRON AGE Salutes Charles L. Huston," which has recently been handed to me. I appreciate all the kind things you have said about me in this article.

CHARLES LUKENS HUSTON
Vice President
Luken Steel Co.
Coatesville, Pa.

To 94-year old Mr. Huston, who is just a year younger than THE IRON AGE, we extend sincerest best wishes.—Ed.

ROBINSON-PATMAN ACT

Much thought is being given here in scrap circles to invoking the Robinson-Patman Act It would seem from the recent rulings of the U. S. Supreme Court and from the ruling of the Circuit Court of Appeals that a scrap dealer can't operate a yard in competition with other dealers and at the same time be a broker. For being a broker gives him an unfair advantage over the other dealers because it enables him to pay more for scrap to collectors and producers. Time and again dealers who are also brokers have lured away business from other dealers by passing on what should have been their brokerage fee to the collector or the factory that had the scrap. The U. S. Supreme Court and the U. S. Circuit Court of Appeals have recently both ruled that anything which tends to give a competitor an advantage in a price way is a violation of the Robinson-Patman Act. It seems to us that under this Act we can compel dealers who are also brokers to choose between being a dealer or a broker; they can't be both.

ALFRED SLOTINKOFF
Rochester, N. Y.

In the example you cite where one firm acts as both scrap dealer and scrap broker the firm probably has no competitive advantage over other brokers. Whatever advantage it has is derived from the fact that it acts both as dealer and broker. We see nothing illegal in that—Ed.

BATTERY LEAD

We are contemplating going into the business of collecting automobile storage batteries and would appreciate information as to procedure, that is, shipment, should the battery separators be removed, to whom do we sell this material—to smelters, or what other people might be interested in purchasing this stock? Also, we would be interested in learning what percentage of pure lead remains after the battery has been smelted or refined.

H. S. PADAWER
Padawer Bros.
Memphis, Tenn.

It will not be necessary to remove the separators, as most dealers leave these in together with the lugs. It is necessary to remove the rubber battery case. When the separators are left with the plates, 71 to 73 pct of lead and antimonial lead is recovered. The batteries should be sold to battery lead smelters and shipped in 5-ton truckload or carload lots.—Ed.

BACK ISSUES

We are interested in securing copies of all issues of THE IRON AGE, either as bound volumes or individual copies, for the year 1940 through 1949 inclusive. If there are copies which are not available, possibly you can suggest where we might locate them.

E. PETERSON
Chief Engineer
Birdsboro Steel Foundry & Machine Co.
Birdsboro, Pa.

Occasionally subscribers notify us that they have available complete bound volumes of back years of THE IRON AGE but at the present time we don't know of any that are available. Due to the variation in demand for individual issues, our own files are spotty. Only for the year 1949 can we come close to supplying a complete file. Probably the simplest way to secure a complete file would be to contact a back issues dealer such as the H. W. Wilson Co., 960 University Ave., New York, N. Y.—Ed.

MACHINERY EVALUATION

Within the past six months, an article appeared in one of the magazines which we receive in our office giving the evaluation of new machinery. The article was very thorough in its explanation of the method for selection of new machinery, making comparison of initial cost, depreciation, production, etc. Examples were also given showing how all factors were evaluated. A reprint of this article or information on how it could be obtained will be greatly appreciated.

W. W. MYER
Asst. Sales Manager
Guibert Steel Co.
Pittsburgh

Several months ago a chart appeared in IRON AGE giving a basis of evaluation for the purchase of new machinery. This originated with the National Machine Tool Builders Assn., which published a booklet on the subject. To get the complete treatment of the subject, write to the association, whose address is Terminal Tower, Cleveland, Ohio.—Ed.

HARD SURFACING ROD

Please furnish the name and address of the company making Amsco Tube Tungsite hard surfacing rod which is mentioned in the article "Hardsurfacing Sand Muller Plows."

DEAN SMITH
Purchasing Agent
Sumner Iron Works
Everett, Wash.

Amsco Tube Tungsite hard surfacing rod is a development of American Brake Shoe Co., 230 Park Ave., New York 17.—Ed.

Good Performance of Floors and Grout Assured In Crucible Steel's New Midland Plant because—

Three-stand — 4-high tandem mill by United for cold rolling stainless and alloy steel in new $18,000,000 plant of Crucible Steel Co. of America, Midland, Pa. Plant comprises three-quarters of a mile of connected buildings. Engr — private plans; Gen'l Contr — Rust Engineering Co., Pittsburgh, Pa. Non-colored and black Masterplate Floors in mill, tile red in motor room. Embeco grout for equipment.

All Concrete Floors Are MASTERPLATE . . . All Equipment Is Grouted with EMBECO

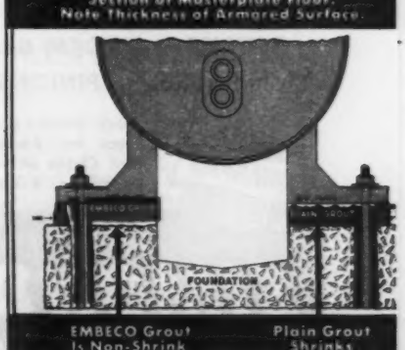
Many leading steel plants, like Crucible Steel Company's new hot and cold rolled stainless sheet and strip mill, have assured themselves of good performance and long-term economy in *floors* — by installing Masterplate Iron-Clad Concrete Floors; also in *equipment* grout — by using Non-Shrink Embeco.

Masterplate Floor . . . is a concrete floor with an iron-armored surface about one-eighth inch thick produced with Masterplate at time floor is installed. Wears at least 4-6 times longer than a plain concrete floor. Other features — spark-safe, static disseminating, non-dusting, corrosion resistant, easy-to-clean, non-slip, economical. Eleven colors.

Non-Shrink Embeco . . . when added to grouting mortar overcomes shrinkage, the principal cause of failure in machinery grouts. Embeco also produces easy placeability, early strength to avoid long costly shut-downs, 7 day normal strength in 24 hours with increased ultimate strength, and maximum bearing for bedplate.

Full information on Masterplate and Embeco on request.

Section of Masterplate Floor. Note Thickness of Armored Surface.



EMBECO Grout Is Non-Shrink — Plain Grout Shrinks

MASTER BUILDERS

CLEVELAND 3, OHIO — TORONTO, ONTARIO

LARGE CUT GEARS

Cutting three identical spur gears simultaneously at Simonds Gear.

Cut Gears for Industrial Needs!

For special gears in larger sizes—exact duplicate gears for replacements—for every heavy-duty industrial gear application—look to SIMONDS GEAR where specialty gears for heavy industry have been a custom service for more than 50 years. Within easy shipping distance of many heavy industry plants—with a personalized service designed to meet your most exacting specifications—SIMONDS GEAR provides an unusually prompt and efficient service on even the most unusual gear requirements. Sizes range up to 145" dia. in all popular gear-making materials. Send your inquiry today and get acquainted with SIMONDS GEAR Service.

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Dear Customer

by

Jack R. Hight

BUSY MONTH — Next week will see a lot of special material in the editorial section of THE IRON AGE featuring the metal powder industry. We have been the leading publication in reporting developments in this new industry. As the Metal Powder Association holds its annual meeting, THE IRON AGE will again be in the forefront as the feature technical section of the magazine recognizes this issue. The Metal Powder Association meeting itself will be held in Detroit, April 25 and 26.

Special editorial coverage on the foundry issue will be the feature of the May 4 issue of THE IRON AGE, honoring the May 8-12 annual convention and trade show of the American Foundrymen's Association. This issue of the magazine will see a series of special articles of particular interest to the foundry industry, as well as furnishing a lot of helpful information about the Cleveland Trade Show itself. THE IRON AGE will have a booth at the Foundry show, look us up.

What with one meeting after another, May is going to be a busy proposition for the metalworking industry. Beginning May 3 the National Machine Tool Builders' Association will have its spring meeting at the Edgewater Beach Hotel in Chicago. The Foundry show starts in Cleveland at the Public Auditorium May 8-12. On May 10 the Machinery Dealers' National Association annual convention begins in Detroit. May 22-24 the American Supply & Machinery Manufacturers' Assn. will sponsor the industrial supply convention in Atlantic City.

For the busy executive to attend all of these meetings is just going to be impossible. Some of them will try, of course, but they will suffer for it. We recommend as an alternative that you read THE IRON AGE for reports on those meetings that you just cannot reach personally. THE IRON AGE will have skilled editors on hand to get all the low down for our readers. There will be a good account of just what goes on at each meeting.

Then again, if you are a convention goer like some we know, you may need to read THE IRON AGE to find out about what went on at the ones you did attend.

GLOBAL LETTER

REVIEW OF WORLD MARKETS

Britain to cut housing spending . . . Steel saved to help offset increased needs of metal-using industry . . . Sweden gives green light to British, French car imports.

London—Higher echelon strategy of the British Government Economic Survey for 1950 may deprive the Englishman of the home and automobile he has been hoping for but it promises him more to eat, wear, and smoke. Concentrating on capital expenditure for vital dollar-earning industries, the government will nip housing spending in 1950 to $1,134,000 from $1,190,000 in '49. Exports are expected to increase.

The government envisions an increase in 1950 steel-furnace capacity but that supply of materials will not permit as great an increase as in '49. Output this year is expected to reach between 17.6 and 17.9 million tons.

Steel Saved for Purpose

Domestic requirements will be 280,000 tons greater this year and steel saved by cutting construction will be more than offset by a 4-5 pct increase in production activity of the metal-consuming industries.

To meet demands of export and home consumption, it may be necessary to draw limited quantities from stock until 1951 when supply and demand should be more nearly balanced. Reserve stocks have been increased by something like 896,000 finished tons and are considered strong enough to stand the drawing.

The scarcity of tinplate and sheet will be modified when the new mills in Margam and Trostre, South Wales, open production in 1951.

Coking Plant Contract Awarded

London—One of the largest coking plant contracts to be executed in the British Isles has been won by Simon Carves Ltd., of Stockport, Lancashire. The firm will build the $6,300,000 coke-oven plant at the Shotton, Flintshire, steel works of John Summers and Sons, Ltd.

It will erect 88 compound superjet ovens to treat 1650 tons of coal daily, a by-products plant necessitated by the introduction of iron smelting at the works.

Sweden to Spur Car Imports

Sweden—Money for fares to export industry plants essential to boosting national production is being loaned by the Swedish Ministry of Labor to unemployed workmen. Considered most important are the iron ore mines, iron and steel works, shipyards, paper and pulp mills, spinning and weaving mills.

Britain and France will increase shipments of automobiles into Sweden. They are the country's largest post-war suppliers and will be given the green light in Sweden's foreign trade liberalization program. Sweden seeks to replace its old fleet of motor vehicles, numbering 260,000, including 15,000 more private cars than in 1939.

Swiss Car Market Competitive

Geneva—France and America sold almost an equal number of cars in Switzerland in 1949—6000 each. The country provides a highly competitive market for motor cars. It was evidenced recently at the Geneva motor show where continental producers displayed their automotive wares in an effort to wrest away from American and British firms their share of the market lost in the post-war period. Prices were lower than in 1949.

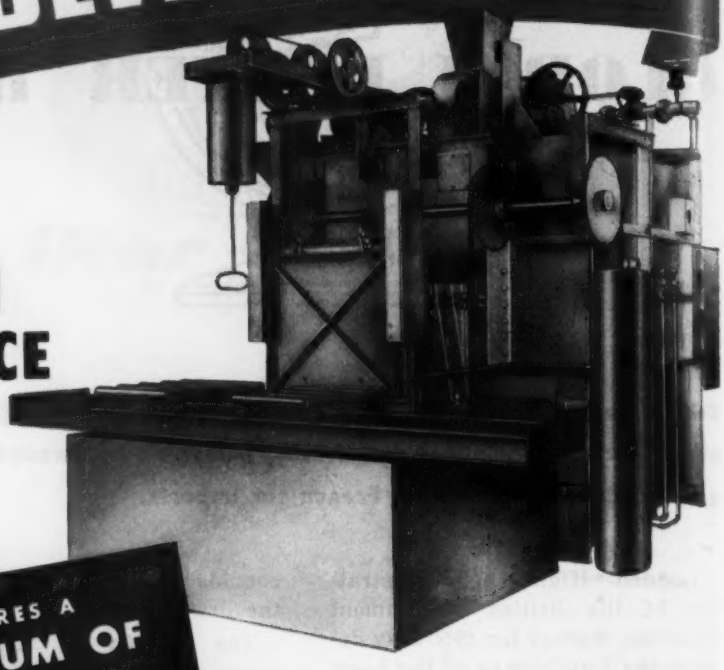
Lead Stricken from Ration List

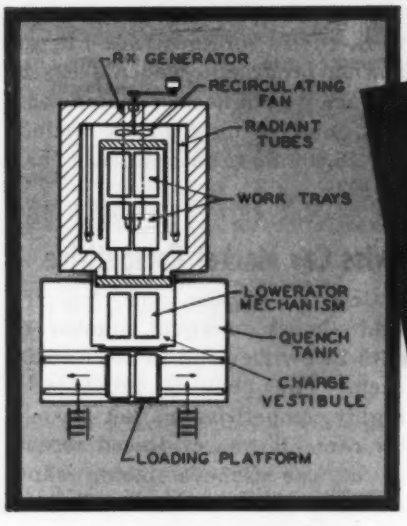
London—Although one of the scarcest of base metals, the price of lead took a sharp plunge during the past year. Thus the British Ministry of Supply suspended it from the allocation system on Apr. 1. Manuafcturers will now have a semi-plentiful supply, being able to buy all they need for a given period. They will not be permitted to stock it and licenses still are in force.

A ★ New AND IMPORTANT DEVELOPMENT

'Surface' HIGH PRODUCTION BATCH-TYPE FURNACE

***WITH BUILT-IN RX ATMOSPHERE GENERATOR**





REQUIRES A **MINIMUM OF CAPITAL INVESTMENT** PER POUND OF CAPACITY

DESIGNED FOR GREATER ECONOMY OF PRODUCTION

'Surface' researchers and engineers have combined all the time-proven features of furnace design into a unit that meets all the requirements for LOW COST, HIGH PRODUCTION of heat treated pieces.

Investigate its Cost Reducing Possibilities for your plant — Today! There is no obligation.

★ **HIGH-RATE BATCH PRODUCTION** . . . Heats a gross load up to 200 lbs. per hr. per sq. ft. of hearth area, depending upon work and type of loading. Gross charge capacity of furnace up to 2500 lbs.

★ **LOW COST** . . . minimum investment for each pound of capacity. Light case cyaniding can be done for less than one-half cent per pound of work, exclusive of burden and fixed charge.

★ **EXTREME FLEXIBILITY** . . . especially adaptable to *Gas Carburizing, Carbon Restoration (Skin Recovery), Dry (gas) Cyaniding, Homogeneous Carburization, Clean Hardening, and for General Heat Treating.* Recommended for miscellaneous parts such as bolts, screws, fittings, etc., and straight shafts up to 12-13 inches long.

★ **'SURFACE' RADIANT TUBE HEATING** . . . with baffle between the work and the tubes.

★ **FASTER HEATING** . . . fan is used to circulate the heated prepared gas atmosphere around the work to secure a higher rate of heating and improve contact with the load.

★ **BUILT-IN 'SURFACE' ATMOSPHERE GENERATOR** . . . eliminates the need for an external generator, resulting in fuel and floor space economies.

★ **LOADING AND UNLOADING MECHANISM** . . . consists of two alloy screws to move loaded trays in and out of furnace. Furnace holds four trays at a time.

★ **AIR COOLING OF WORK** . . . can be done in the charge vestibule, or—

★ **LIQUID QUENCHING** . . . a lowerator mechanism provides means for oil quenching loaded trays in quench tank built adjacent to front of furnace beneath charging vestibule.

★ **SAVES FLOOR SPACE** . . . overall dimensions approximately 16-feet long (including quench tank) by 9-feet wide by 13-feet high. Occupies only 144 square feet of floor space.

*Optional

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

'Surface' **INDUSTRIAL FURNACES**

These Two Valuable "Tools" of

V-BELT DRIVE

Design and Application

. . . are *Yours* for the *Asking!*

The Gates "GUIDE for SELECTING or DESIGNING V-BELT DRIVES" is widely recognized as the most *comprehensive* and *complete* book of its kind—and also the *easiest to use.* It enables you to find all the possible combinations of stock drives for your machine with the *least amount of calculation*—and almost *automatically* gives you the drive of *lowest price* that will be adequate for the job.

Saves You Time, Work and MONEY

The GUIDE tells all about "Design Horsepower" and Speed Ratios—and by merely *scanning* a page of GUIDE designs which use the *stock pulleys* that meet your needs, you can quickly determine the center distances that will fit your equipment layout while, at the same time, enabling you to use *standard belts!*

You Can Design ANY Drive

The Gates GUIDE tells *when* you can use a *V-Flat* drive—and gives you a simple way to choose a practical V-Flat design using *stock* driver sheave with whatever flat pulley you may already have on hand.

As a matter of fact, by using the Gates GUIDE you can design—with a *minimum of calculation—any kind* of V-Belt drive for every kind of operation—including quarter-turn drives and Dubl-V drives.

Written By GATES Engineers

The GUIDE is compiled and written by Gates Engineers. It embodies their specialized knowledge gained through operating the largest V-Belt testing laboratories in the world! Here, an average of *32,000 hours* of testing *per week* are run on V-Belts alone! No wonder the Gates "GUIDE for SELECTING or DESIGNING V-BELT DRIVES" is regarded by Engineers as the *authority* on V-Belt Drive design.

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The Gates "INDUSTRIAL NEWS," published monthly, gives interesting "case histories" of V-Belt drive installations designed and used by practical operating men and engineers. These case histories are selected from thousands of applications. Among other things they show — what can be accomplished with V-Belts — how to install various drives—unique applications—unique uses — examples of savings — and other valuable "how-to-do" ideas.

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Eng. 501

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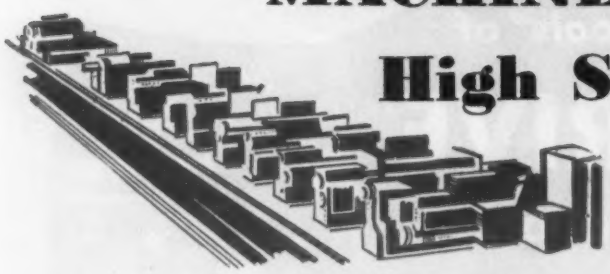
MACHINE TOOL High Spots



Sales Inquiries and Production

Vigor lent industry by big steel demand . . . Survey shows equipment spending cut . . . Europe to stage full-scale exhibits.

by William A. Lloyd

Cleveland—Paced by a big demand for steel, which promises to last through the third quarter, a continuing upward trend in machine tool order volume was reported this week by major segments of the machine tool industry.

April order volume to date has prompted optimism in some quarters, despite uneven distribution of new business. Volume of inquiries and quotations is good—sufficient evidence for some observers to predict that the industry will have a big second quarter.

A large part of the present volume of orders stems directly or indirectly from the automotive programs in Detroit. A number of comparatively small government programs and some foreign business have rounded out the spread.

Less Equipment Spending

Current performance of the machine tool industry is particularly interesting in light of a survey made public this week by the Department of Commerce and Securities and Exchange Commission, indicating that every major industry group will spend less for plant and equipment this year than in 1949. Plant construction accounted for 30 pct of the $18,100,000,000 spent by major industry groups last year.

The survey points out that actual outlays for the last quarter of 1949 (when the present upward trend in machine tool orders got underway) and the current quarter were higher than estimated. The first quarter increase, the agencies said, may "indicate an increased confidence in the business situation," while the fourth quarter of 1949 boost was due largely to accounting adjustments.

European Exhibits Planned

Foreign exhibitions are getting serious attention from leading companies in the industry. About 25 company representatives are at Milan, Italy, this week, where the Milan Exhibition is scheduled to open April 12. The Hanover Exhibition at Hanover, Germany, opens May 8. Several companies are exhibiting at both.

This is perhaps the first time most machine tool builders have had a chance to see what one export sales manager calls "a real exhibit." Previously, many builders simply showed customers' machines in transit. This time, machines have been sent from the U. S. for exhibition purposes primarily, tooled up and ready to run under power.

Elsewhere in the foreign markets, some business is coming in from France and Switzerland and from China. The Chinese, it appears, have got some money they've either got to spend or give back and are buying standard general purpose machines.

Retooling Helps Industry

In Washington, ECA announced that nearly a billion dollars worth of modern machinery has gone into Marshall Plan countries during the past two years. Of this amount, machine tools accounted for $92 million.

In Detroit, machine tool pressures continue to stay up in the face of major retooling for new engines for Ford, Lincoln, and Chrysler. The Ford six program, according to trade reports, is now well along and the Lincoln program has reached high temperature stage. Some decisions have already been taken on the Lincoln engine, it is believed, and awarding of contracts is expected. The Lincoln engine is scheduled for production in the Ford aircraft building at the Rouge.

Chrysler Plans New Engines

Despite the strike, Chrysler is continuing to move on its new engine program for the Chrysler Division. It is anticipated that DeSoto engine production will be moved to the DeSoto plant and some buying for plant improvement there is anticipated by the trade. Meanwhile, the new Chrysler high compression overhead valve V-8 is moving ahead.

Engineering is progressing on a six-cylinder Chrysler power plant, it is reported, but this program is still on the drawing boards. Most sources believe a high compression in-line engine is involved.

The Chrysler strike is showing its effects and some retarding influence on buying, particularly by small shops, has been reported. Failure to end the Chrysler strike within the next few weeks is bound eventually to take a serious toll in the Detroit machine tool market, although activity right now is at a level that tends to minimize any adverse effects of the strike.

This is another of the "HUNDREDS OF JOBS" which can be done only on a MARVEL Band Saw!

MARVEL BAND SAW saved these two 4400 lb. castings

Two sand cores washed out when these giant 4400 pound steel connecting rods were cast, resulting in solid eye ends without gaps. Then came the $64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco did this "impossible" job easily, quickly and economically, without special tooling, on a standard Model #8M/2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of $3.06 per rod. The tool was a MARVEL, B9-10 Band Saw Blade.

Every tool room, machine shop and maintenance department needs a MARVEL Series 8 Universal Band Saw—not only for innumerable everyday jobs but for the occasional "trick" operations, where its utmost versatility will save many headaches and dollars.

WRITE FOR CATALOG

MARVEL *Metal Cutting* SAWS

Better Machines-Better Blades

These exclusive MARVEL Features made this job easy!

1. Large, T-slotted work table.
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PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Alloy Steels

Mechanical properties, test results, properties at high temperatures and machinability ratings for Rycrome and Nikrome, two new high performance alloy steels, are given in a 4-p. bulletin. *Joseph T. Ryerson & Son, Inc. For more information, check No.* 1 *on the postcard.*

Conversion Units

Fawick conversion units, combining the Fawick Airflex Clutch and Air Ring Brake, are described and illustrated in a new 9-p. bulletin. *Fawick Airflex Co. For more information, check No.* 2 *on the postcard.*

Wire Cloth and Screen

Industrial wire cloth and screen to fit any requirement is covered in a new 32-p. booklet also describing the variety of equipments necessary for production and processing. *Ludlow-Saylor Wire Co. For more information, check No.* 3 *on the postcard.*

Air Compressors

The new L design Ingersoll-Rand electrically driven, crosshead type heavy duty air compressors in sizes from 125 to 350 hp are described in an 18-p. catalog. *Ingersoll-Rand Co. For more information, check No.* 4 *on the postcard.*

Powdered Metals

A new 4-p. folder describes advantages and limitations of the powdered metal process, and shows examples of 25 powdered metal machine parts with proven savings over previous methods of production. *Wel-Met Co. For more information, check No.* 5 *on the postcard.*

Production Control

The new model C-1 Chronolog and its system of production control is described in an illustrated 6-p. booklet pointing out adaptability to any production job. *Chronolog, Inc. For more information, check No.* 6 *on the postcard.*

Pickling

How costs can be cut in the pickling department of steel and other plants is described in a 8-p. booklet, which quotes records of equipment used to pickle steel in all forms. *International Nickel Co., Inc. For more information, check No.* 7 *on the postcard.*

Hand Hoists

Action photographs, specifications and cross sectional views of Wright Safeway hand hoists are presented in a new 6-p. folder listing features of the equipment. *Wright Hoist Div., American Chain & Cable Co., Inc. For more information, check No.* 8 *on the postcard.*

Electro-Precipitation

Explanation of how electrostatic precipitation works is given in a new 16-p. bulletin, which also presents case histories of seven typical installations where the system is used. *General Electric Co. For more information, check No.* 9 *on the postcard.*

Ground Flat Stock

Sizes and prices of three types of ground flat stock of first quality tool steel are given in folder. Temperature charts and hardening instructions are also given. *Brown & Sharpe Mfg. Co. For more information, check No.* 10 *on the postcard.*

Metal Cleaning

Parco emulsion and solvent type, acid type, and alkaline type cleaners are described in a new 8-p. booklet, which also explains proper surface preparation. *Parker Rust Proof Co. For more information, check No.* 11 *on the postcard.*

Motor-Generators

The performance and construction features of Janette's line of motors and generators are outlined in bulletin 15-1. They are available in a wide range of capacities, voltages and cycles. General specifica-

Turn to Page 128

USE THIS POST CARD

NEW

PRODUCTION IDEAS

New and improved production ideas, equipment, services and methods described here offer production economies. For price and other information, fill in the attached card and mail it.

Metal Primer

Excellent adhesion on hard-to-coat magnesium and aluminum without chemical or electrochemical pretreatment is said to be effected with the new Unichrome Primer AP-10. After the metal has been cleaned, the primer is applied by spraying or dipping. It can be air-dried to a dust-free finish in 5 min. Baking between 5 min at 350°F and 20 min at 300°F produces a coating of greatest durability. The primer may be top-coated with lacquers, synthetics, or baking enamels. *United Chromium, Inc. For more information, check No. 23 on the postcard.*

Welded Stainless Tube

A free-machining welded stainless tube for products that demand corrosion resistance combined with ready machinability is recommended for parts that must be fabricated by threading, turning, reaming, drilling, etc., and for difficult to machine parts where smooth surfaces are required. The steel handles in automatic screw machines at 70 pct of the speed of SAE 1120. Non-galling properties make disassembly of parts easy and help to avoid scratching or galling in moving parts. Welded stainless tube is available in rounds or shapes from ¼ to 4½ in. OD and in all standard wall thicknesses. *Carpenter Steel Co. For more information, check No. 24 on the postcard.*

Wheelheads

Hi-Frequency wheelheads in a complete new line cover the entire range of sizes and styles for internal grinding. Eight different models cover the range from 6000 to 100,000 rpm, with the two smallest size heads having a combined range of 45,000 to 100,000 rpm and arranged to take mounted point wheels. The Hi-Frequency Red Heads are designed for high speed small hole grinding beyond

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NEW

PRODUCTION IDEAS

Continued

the practical limits of conventional belt driven heads and are said to provide surface speeds unavailable with standard type heads. *Heald Machine Co. For more information, check No. 25 on the postcard.*

Babbitt Bonding

Tintite babbitt bonding compound has been improved to a metallic paste in collapsible tubes. The paste is more highly concentrated, effecting a more powerful bond between the babbitt lining and the bronze, steel or cast iron shell. It is only necessary to spread the Tintite over the surface of the shell, heat the shell to 600°F, then wipe the surface to a bright finish and proceed to pour the babbitt. *United American Metals Corp. For more information, check No. 26 on the postcard.*

Activated Carbon

For purifying bright nickel solutions, including the H-VW-M 9H solutions and other acid and alkaline plating solutions, a new activated carbon called Pur-O-Carb is said to have consistent high quality and uniformity. Every production batch is tested for effectiveness. *Hanson-Van Winkle-Munning Co. For more information, check No. 27 on the postcard.*

Electric Tiering Truck

A telescopic straddle type tiering truck handles any standard size two faced pallet. Forks elevate to 130 in. The power unit assembly containing the drive and elevating motors, battery, etc., is interchangeable on all types of the company's electric tiering trucks. Right angle stacking in aisles narrower than the overall length of the truck and the load is possible. Offset drive with the stabilizing knee-action caster gives cam-pattern-steering. *Lyon-Raymond Corp. For more information, check No. 28 on the postcard.*

Lapping Tool

A constant, self-expanding pressure between lap sleeves and work features the new Xpand-O-Lap. The tool consists of one steel arbor, two serrated copper sleeves and one S - shape pressure spring. The spring applies constant, even pressure against the two sleeves. Diagonal grooves in the sleeves serve as channels for the lapping compound, assuring uniform distribution, making lapping faster and smoother, eliminating galling or seizing. Xpand-O-Lap is available in sets of six laps or individually. *Ideal Industries, Inc. For more information, check No. 29 on the postcard.*

Shunt Connection

Development of Statite, a new permanent shunt connection for carbon brushes has been announced. Tests under severe operating conditions have shown Statite cannot be pulled out or jarred loose from the brush, will maintain the original low millivolt drop, will not oxidize, and is unaffected by extreme operating temperatures. *U. S. Graphite Co. For more information, check No. 30 on the postcard.*

Paint Stripper

A rapid stripper of high baked acid and alkali-resistant finishes removes carbonized films and hard caked buffing compounds in 2 to 5 min. Speed is accomplished without the use of solvents. Loncoterge No. 2063 can be used as received or as a water dilution. It is used in temperature ranges of 155° to 225°F. *London Chemical Co. For more information, check No. 31 on the postcard.*

Welding Shield

A welding shield designed for getting into offset or close places where the welder cannot normally see to make the necessary weld comprises a conventional type fiber

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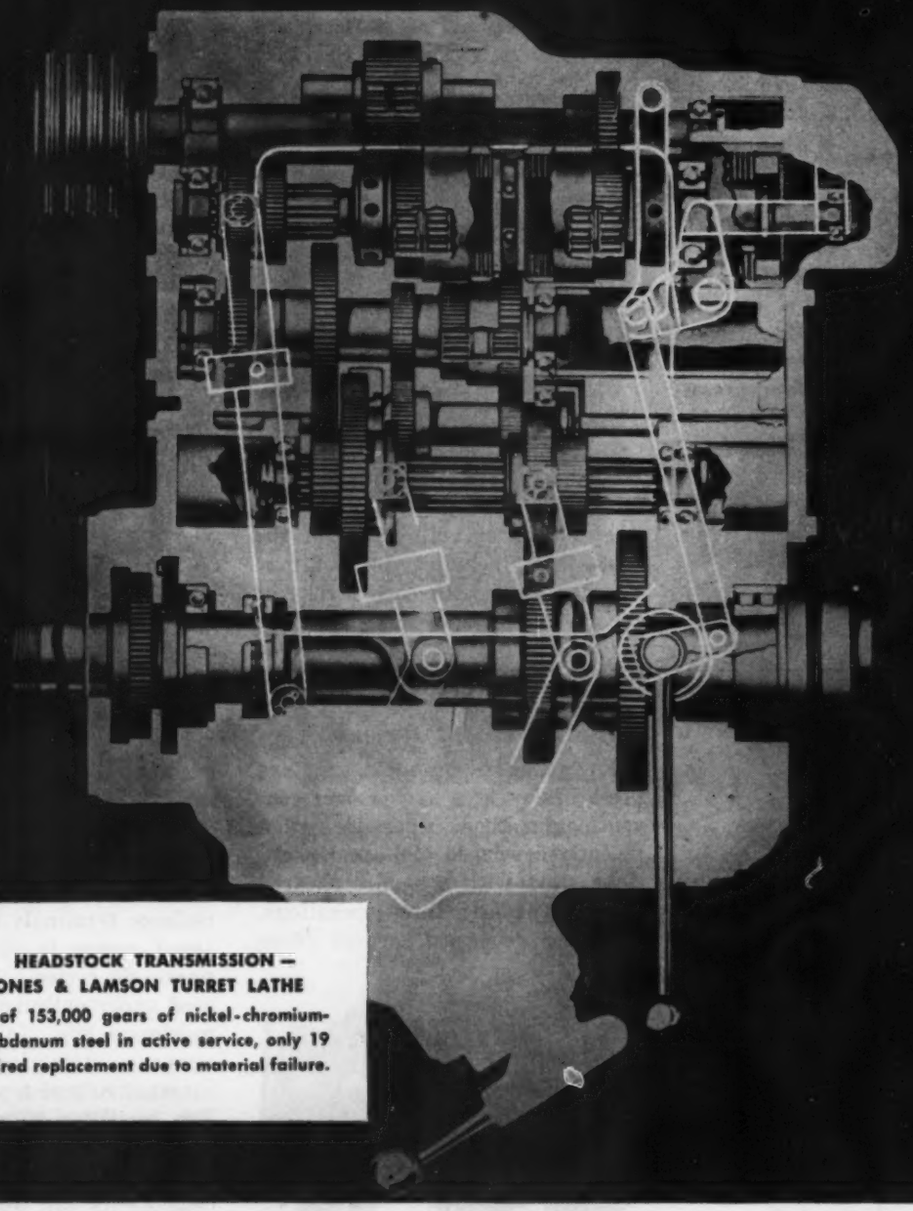


HEADSTOCK TRANSMISSION — JONES & LAMSON TURRET LATHE

Out of 153,000 gears of nickel-chromium-molybdenum steel in active service, only 19 required replacement due to material failure.

A study of replacements during a 12-month period of World War II revealed an astonishing performance record for nickel-chromium-molybdenum steel gears used in the headstocks of Jones & Lamson Ram Type Turret Lathes. In spite of frequent overloads and punishment due to inexperienced operators, failures were cut to less than 00.02%. Because of this remarkable record, Jones & Lamson Machine Co., Springfield, Vt., continues to specify these shafts and gears in "872" and "874" nickel-chromium-molybdenum steels produced by Carpenter Steel Company, Reading, Pa.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

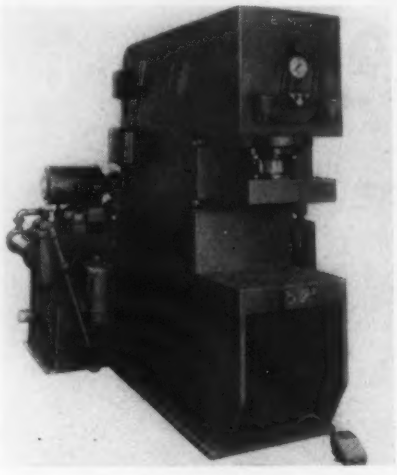
NEW PRODUCTION IDEAS

Continued

shield to which has been added a reinforced periscope. The unit gives a true picture with no reverse effect. *Industrial Products Co. For more information, check No.* 32 *on the postcard on p.* 35.

Openside Press

Shearing, riveting, and straightening on forged steel parts can be performed on an openside hydraulic press in one cycle of operation. The press has a moving platen 18 x 16 in. and 3-in. stroke. High and low pressure pump provides rapid advance, slower press-



ing speed and rapid return. Photoelectric safety control stops platen immediately if obstruction breaks the light beam at the entrance to dies. The machine is accessible, fast and flexible, and rated at 35 cycles per min. Sizes and capacities can be provided for various service needs. *American Steel Foundries, Elmes Engineering Div. For more information, check No.* 33 *on the postcard on p.* 35.

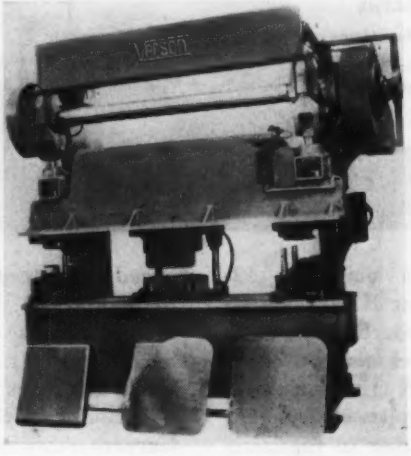
Burring Machine

Spur or helical gears, and multistart worms up to 7 in. diam can be handled on a new high speed precision burring and chamfering machine. It operates continuously at a speed of 300 teeth per min, or intermittently when equipped with an automatic work cycle to stop the machine after the part has been completely burred. Low cost tooling and long life cutters are important features. The cutters are sharpened by grinding the face

angle. One or both flanks of the tooth form, including the root, may be chamfered with each stroke of the cutter. *Sheffield Corp. For more information, check No.* 34 *on the postcard on p.* 35.

Forming Ball Corners

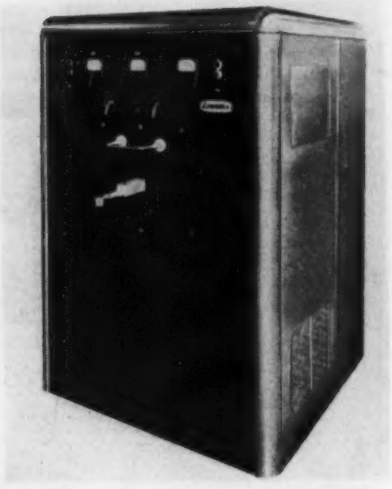
Forming ball corners in standard press brakes at a saving over conventional methods is possible with a recently developed tool-up. Operations start with a square sheared blank. The first three operations, trimming developed corners (four



strokes), drawing the corners in four strokes and cam trimming after the draw, are performed in a single intermediate press brake equipped with three sets of dies. The fourth operation, restriking the side flanges, also requiring four strokes, is performed in a second brake equipped with a sectional restrike die. A ball corner panel can be completed in only two handlings without any special machinery. The tool-up is adaptable to a wide variety of sizes. *Verson Allsteel Press Co. For more information, check No.* 35 *on the postcard on p.* 35.

Induction Heater

The LI-10 induction heating unit is a heavy duty, vacuum tube converter, capable of supplying 10 kw at 450,000 cycles per sec, and can be used in many metal heat treating and fabricating operations. Single and two station models are available with high and low im-



pedance terminals at each station. Input power is 230 or 460 v, 3 phase, 60 cycles. Tubes are operated under optimum conditions for maximum life. All filament voltages are automatically regulated by constant voltage type transformers. The oscillator tube is air cooled, and a make-up type, temperature controlled water system cools tank components and work coils. *Lindberg Engineering Co. For more information, check No.* 36 *on the postcard on p.* 35.

Centerless Grinder

Designed for battery installation, a new Model 180 centerless internal grinder features a central hydraulic system. Central coolant supply adaptation as well as central power source for optional

Turn to Page 149

Iron Age *Introduces*

ROBERT W. GRAHAM, general superintendent, Dusquesne Works, Carnegie-Illinois Steel Corp.

KING H. McLAURIN, special representative, operating department, Carnegie-Illinois Steel Corp.

ROGER M. KYES, general manager, Truck & Coach Div., General Motors Corp.

Robert W. Graham has been appointed general superintendent of the Duquesne Works of CARNEGIE-ILLINOIS STEEL CORP. **King H. McLaurin** was transferred from that position to the company's general offices in Pittsburgh as a special representative in the operating department. Mr. Graham has been assistant general superintendent of Homestead District Works for the past 2 years, while Mr. McLaurin has served as general superintendent of the Duquesne Works since 1936.

C. W. Roberts was elected as vice-president of the AMERICAN CAN CO., in charge of the Pacific Division. He succeeds the late **E. H. Bell**, who died last January.

J. C. Jay, for the past 3 years sales manager of SAFEWAY STEEL PRODUCTS CO., Milwaukee, has been advanced to vice-president in charge of sales. **W. H. Mettelhan**, secretary, was made vice-president and controller of the company.

John L. McLaughlin was made assistant manager of service for the CHICAGO VITREOUS ENAMEL PRODUCT CO.

Marvin J. Bair has been made general manager of sales for the THOMAS STEEL CO., Warren, Ohio, succeeding the late **William F. Rummell.** Mr. Bair had served as Mr. Rummell's assistant for several years.

Roger M. Kyes was made general manager of GENERAL MOTORS CORP., Truck & Coach Div. Mr. Kyes has served as assistant general manger of the division since last October and succeeds **Morgan D. Douglas**, who is taking a leave of absence. Mr. Kyes joined General Motors in 1948 and served as director of its central office procurement and schedules staff until his appointment to the GMC division.

Lawrence Gubb and **C. E. Dearnley** have been elected directors of the RIVERSIDE METAL CO. Mr. Gubb, until recently, was chairman of the board of PHILCO CORP., and Mr. Dearnley is president and treasurer of DEARNLEY BROS. WORSTED SPINNING CO., INC., Philadelphia.

E. J. MAGEE, head of industrial relations department, Republic Steel Corp.

WALTER M. NELSON, head of safety program, Republic Steel Corp.

R. H. FERGUSON, assistant director of industrial relations, Republic Steel Corp.

E. J. Magee was named to head the industrial relations department of REPUBLIC STEEL CORP., succeeding **J. A. Voss**, who submitted his resignation following an extended period of illness. Mr. Magee is a veteran of 27 years with Republic and its predecessor companies. **R. H. Ferguson**, who had been manager of safety since 1933, was appointed assistant director of industrial relations. **Walter M. Nelson** will succeed Mr. Ferguson as head of the company's safety program.

David E. Davidson has been elected vice-president for sales, with headquarters at executive offices in Chicago, of the LINK-BELT CO. All other officers who served last year were re-elected. **Eugene P. Berg**, formerly assistant general manager, has been appointed general manager of the Pershing Road plant to succeed Mr. Davidson.

E. W. Berger, for 20 years a sales executive of the Chevrolet div. of GENERAL MOTORS CORP., has been named assistant general sales manager of KAISER-FRAZER CORP. Mr. Berger will direct the work of the national field sales organization.

John W. Todd, for many years Pittsburgh district manager for CHARLES DREIFUS CO., has joined the M. N. LANDAY CO., Pittsburgh.

Thomas J. Dempsey, Jr., was added to the sales force of the L. N. CRISSMAN CO., Pittsburgh. Mr. Dempsey will handle sales in the Pittsburgh area.

Howard L. Hyde was elevated to rank of vice-president of the GOODYEAR TIRE & RUBBER CO. He has been general counsel and assistant secretary of the company since 1940.

J. J. Sullivan was named superintendent of REPUBLIC STEEL CORP.'S 98-inch hot strip mill. Mr. Sullivan succeeds **W. M. Ramsay**, who resigned. He has been with Republic since the erection of the 98-inch strip mill in 1937.

Charles R. Ellicott has been made eastern district sales manager with headquarters in New York City for the DUFF-NORTON MFG. CO. Mr. Ellicott formerly held sales engineering positions with WESTINGHOUSE ELECTRIC CORP. and SYMINGTON-GOULD CORP.

Cecil H. Gay, works manager of the Barberton plant of BABCOCK & WILCOX CO., was elected a vice-president by the board of directors. Mr. Gay joined the company in 1928 and has been connected with the Barberton operations since 1932.

DAVID E. DAVIDSON, vice-president of sales, Link-Belt Co.

EUGENE P. BERG, manager, Pershing Road plant, Link-Belt Co.

CECIL H. GAY, vice-president, Babcock & Wilcox Co.

Herman P. Rassbach, former works manager of the MIDVALE CO., has joined the Electro Metallurgical Div. of UNION CARBIDE & CARBON CORP. as metallurgical engineer with the development group. He will make his headquarters in Chicago.

Anthony J. Potts has been appointed Chicago district manager of SELAS CORP. OF AMERICA. Mr. Potts was formerly located in the Selas main office and plant in Philadelphia.

George H. Freers has been promoted by the directors of the MARMON-HERRINTON CO., Indianapolis, to vice-president in charge of engineering. Mr. Freers has held the position of chief engineer with the company for the past 10 years. **Fred B. Croner** was named a vice-president of the company, in charge of procurement. For the past 3 years he has been responsible for the company's purchases of materials and supplies.

James N. Davis, formerly a senior research engineer for the Physics Laboratories of SYLVANIA ELECTRIC PRODUCTS INC., Bayside, N. Y., has been appointed technical representative for the company at Washington, D. C.

Walter Bonsack was named vice-president and director of research for the CHRISTIANSEN CORP., Chicago. He will head technical operations and procedures for all of the company's plants and will be located at the Chicago headquarters, which will be the center of research activities.

WALTER BONSACK, vice-president and director of research, Christiansen Corp.

Iron Age Salutes

CHARLES SIMMONS, SR.

FROM an early reputation as a mere cleaning and painting operation Charles Simmons, Sr., helped make machinery rebuilding into an industry. He did this by infusing a new spirit into elderly machines that had expired by the wayside of depreciation and long service.

Mr. Simmons' fingers had a shade more dexterity in plumbing into the innards of defunct machinery than those of a multitude of fellow tinkerers. He built the 70,000 sq ft Simmons Machine Tool Corp. in Albany, and made it the Valhalla of the world's used machines. He branched out to building new machinery and is now pushing his newly-established Simmons Fastener Corp., which manufactures a quick-operating fastener for use in many industries.

A short balding man of 65, Mr. Simmons is spry enough to enforce the admonition of the sign he displays in his shop: "The Man Who Says I Can't Is Out Of A Job!" His workers are prompted to continue discouraging jobs by the knowledge that their boss can figure out a problem that is stumping them.

Without the benefit of an expensive engineering education, Mr. Simmons at 25 years of age started to manufacture a patented toolholder. He bought second hand machines and discovered that to get proper service from them he had to rebuild them. The toolholder went out the window as he found the work he loved.

With decades of experience behind him, Mr. Simmons was appointed Chief of the Used Tool Div. of the Office of Production Management—a euphemistic title for a prewar organization readying industry for war production. After Pearl Harbor the unit came under the War Production Board.

During the war his plant aided production by rebuilding the vital tools of industry and manufacturing 48 in. gun lathes, turret lathes, and other equipment. He toured South American Naval bases to see if tools were being used to the best advantage.

To lend further prestige and stimulus to his own rebuilding industry, he toured Europe twice, and South America three times, explaining to machinery-pinched foreign industrialists that he could install a new will to work in their battered mechanical servants. In back of every job stands the Simmons guarantee: "Your money back if machine not found satisfactory. No excuses necessary."

Iron Age *Introduces*

Continued from Page 61

VAS L. HOWE, advertising manager, Niles-Bement-Pond Co.

Vas L. Howe has been appointed advertising manager of NILES-BEMENT-POND CO., including the Pratt & Whitney Division, Chandler-Evans Division and Potter & Johnston, Pawtucket, subsidiary. Simultaneously it was announced that **Fred J. Dunne** is appointed to the newly created position of assistant advertising manager.

L. C. Newton was named sales engineering representative for aluminum bronze and silicon bronze vacuum die casting in Minnesota and northern Wisconsin for the AURORA METAL CO., Aurora, Ill.

Mathew J. Heiler, who has served in a sales capacity for the FORD and PACKARD MOTOR CO.'S, has been named a special representative for WILLYS - OVERLAND MOTORS, INC.

Russell W. Bill will head the recently opened New York City eastern sales office of the Shakeproof Inc. Div. of ILLINOIS TOOL WORKS. He will direct the activities of Shakeproof's sales staff covering the territory from Pittsburgh to the Atlantic coast.

A. G. Ricketts was named regional representative with headquarters in Cleveland for the Strand Door Div. of DETROIT STEEL PRODUCTS CO. **Robert Kirkman** will serve in the Dallas area, with **Frank X. Rowell** assigned to Atlanta, and **Glenn V. Hall,** Washington, D. C.

FREDERICK H. NEUHARDT, New York district manager, Clark Controller Co.

GORDON W. FIRST, St. Louis district manager, Clark Controller Co. Corp.

Donald W. McGill has been appointed supervisor of sales training for the central station sales department of WESTINGHOUSE ELECTRIC CORP.

Charles J. Fleisch has been appointed assistant general superintendent of Homestead District Works, CARNEGIE - ILLINOIS STEEL CORP. He succeeds **Robert W. Graham,** whose appointment as general superintendent of the company's Duquesne Works is announced in this issue of THE IRON AGE. **William C. Bennett** was promoted to the position of division superintendent in charge of the Homestead plant's blast furnaces. He replaces Mr. Fleisch in that position.

Douglas M. Considine has been appointed manager of market extension division, general sales, of Brown Instruments Division. MINNEAPOLIS-HONEYWELL REGULATOR CO. He has been with the company since 1941.

Gordon W. First, for many years district manager of the CLARK CONTROLLER CO., Pittsburgh and New York offices, has moved to St. Louis to become district manager. He is a veteran of more than 20 years in the Clark organization. **Frederick H. Neuhardt** succeeds Mr. First as New York district manager.

Robert F. Bourne assumes the post of manager of rolled product sales for the Western Divison of CF&I CORP., Denver. **J. R. Caten** was made division sales manager for the Rocky Mountain Division and **Luke Helms, Jr.,** will leave his post as assistant district manager at Ft. Worth, Texas, to become district sales manager at Phoenix, Ariz.

Gareth W. Speer was named assistant treasurer of the KAISER-FRAZER CORP., Willow Run, Mich. In his new position, Mr. Speer will assist **Webb Wilson,** who was recently named vice-president and treasurer.

OBITUARIES

Raymond T. Melville, 67, district sales manager for the Hanna Furnace Corp., Buffalo, died Mar. 28. He was formerly sales manager for the Rogers-Brown Co., Buffalo, before it was acquired by National Steel Co. in 1927.

C. H. Buckmaster, 43, district manager for Lincoln Electric Co., Detroit, died Mar. 27 as a result of injuries received in an automobile accident.

Eugene L. Messler, Sr., president of the Eureka Fire Brick Works, died on **Mar. 1.**

Alphonse O. Rousseau, abrasive products safety engineer at Norton Co., Worcester, died Mar. 27 at the age of 61 after a brief illness.

Julian P. Cole, project manager for the Stone & Webster Engineering Corp., Boston, and his wife were among 15 passengers and crewmen killed near Ankara, Turkey, Mar. 25, in a plane crash.

Joseph R. Gorman, president of Transue & Williams Steel Forging Corp., Alliance, Ohio, died Apr. 3, at the age of 70.

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On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Nash Rambler innovations seen as challenge to automotive giants . . . Industry's first convertible with sliding top . . . Car is low-priced with many luxury features.

by Walter G. Patton

Detroit — Nash's new lightweight car (2430 lb with 100 in. wheelbase) introduced this week is officially called the Rambler. It could have been called "The Challenger."

With this newest model which belies most of the preconceived notions about a light car, George W. Mason, Nash's energetic president, is challenging several of the basic postwar policies of the giants of the automotive industry.

To Alter Many Views

Those who have seen and driven the new cars give Mason an excellent chance to score a tremendous hit with the public. Some, including the writer, feel that a lot of the present thinking in high automotive circles about light cars will ultimately be changed as a result of the newest Nash entry. The car also seems a good bet to bring about major changes in automobile door construction.

It could have a significant effect on steel buying for auto doors. Its front wheel suspension is likely to start automobile spring engineers into a new round of spirited activity. It is the industry's first convertible with a sliding top. For the first time, rear seat passengers in a convertible are given adequate protection against the wind.

Starts from Scratch

The Rambler line of cars is Mason's answer to the argument offered by the Big Three that the present Chevrolet-Ford-Plymouth is the best possible compromise between first cost, luxurious motoring comfort and operating economy. Mason apparently believes America will go for a light car—if the car is luxurious as well as light.

Mason has been for years one of the industry's strongest advocates of eliminating weight and stretching gasoline mileage. He believes that many of the conclusions arrived at by automobile executives have been reached by the route of trimming down existing models—cutting out the frills and a pound here and there. Mason's approach has been to start from scratch and *build up to a satisfactory transportation package.*

The new Nash Rambler not only eliminates pounds; it also eliminates processing. The processing economies of the new Nash are undoubtedly one of its most important features.

Aluminum Car Ancestry

Contrary to widely held opinions, the predecessor of the Rambler is not the NXI two-passenger model which has recently been exhibited in many cities throughout the country. (THE IRON AGE, Jan. 19, 1950, pg. 40). Rather, the true predecessor of the Rambler was a car built experimentally early in the postwar period.

In this car aluminum was substituted at every opportunity for steel. The car had aluminum panels, aluminum fenders, an aluminum hood — even aluminum bumpers. It had a pancake engine. Curb weight was about 2000 lb. The car was built and tested but the project was abandoned for economic reasons.

Comfort With Less Weight

Nash concluded that steel at the present price is still a more economical construction material than aluminum. Although the aluminum car was abandoned, Nash engineers admit that many of the lessons about weight saving have been of value in designing the new light car.

The much-discussed two-passen-

LIGHTWEIGHT CHALLENGER: Incorporating many interesting engineering, manufacturing and styling details the new Nash Rambler is the first genuine light car designed from scratch to sell in the postwar low price field. Weight is 2430 lbs., about 570 lbs less than other comparable Nash models. As shown in the photograph, the Rambler has an electrically-operated fabricated sliding top with push button control.

ger NXI model is really only a side issue as far as the present Rambler is concerned. It has an indirect value and has undoubtedly given considerable promotional impetus to the new car. There is no direct engineering connection.

Unified Frame Challenge

Nash's second challenge to the industry is a contradiction of the near sacred doctrine that there is no substitute for weight in providing riding comfort in an automobile. Nash's answer to this argument is that with proper weight distribution, with modern springing and with the type of unified body-and-frame construction it is employing, a light car can be built that will ride just as well as a heavier car with a conventional frame.

The new Rambler is also a challenge to those automobile engineers who insist that there are no real economies available through unified body-and-frame construction. In its first unified car built immediately after the end of World War II, Nash took out quite a few pounds. Its latest model weighs (on a comparable basis) about 570 lb less than the Nash Statesman. Incidentally, the light car GM backed away from several years ago was a frameless-type.

The economies of the Nash Rambler do not end with the removal of 570 lbs of metal. An even bigger saving, Nash believes, is the advantage available in processing methods made possible largely through ingenious design and the use of modern welding methods. The most vigorous defenders of the frame-type car agree Nash's assembly line is one of the shortest in the industry.

The big car producers are saying little publicly about unified body-and-frame but doubtlessly they are watching this development very closely. The biggest single objection to this design today is the tremendous retooling cost. Nash jumped this high hurdle early in the postwar period. The new Rambler will be its first opportunity to reap in full the rewards of that momentous decision.

Price to Be Attractive

Between savings in material and more savings in processing, Nash has placed a price on its new Rambler that will be highly attractive to the public. Most of the Detroit experts were guessing $200 to $300 under the comparable Nash Statesman model (when they become available). Nash management this week placed a selling tag of $1808 on the Rambler. Car owners should find it appealing.

It should be pointed out that the potential saving in manufacturing cost of the new Rambler will not be immediately apparent to the car buyer since the convertible will be introduced first. Sometime next summer the attractive new station wagon will go into production. Standard sedans will appear as 1951 models probably not before next January.

The Nash tactic of introducing the luxury models first is unusual. The cars will have a package price —including radio, heater, deluxe trim, direction signals and most of the accessories usually sold at extra cost. This will give Nash an opportunity to trim its price later, in the event competition forces such a move. It should be noted that the present models are deluxe in every respect including accessories, trim and other features.

How Rambler Compares

Should the necessity occur, deluxe features could be changed over night to less expensive designs. To give the reader some idea of the competitive position of the new Rambler, the following comparisons have been set up:

	Wheelbase (in.)	Overall Length (in.)	Shipping Weight (lb)	HP (bare engine)	Weight per HP (lb)
Ford, six 2-door ...	114	196 11/16	2945	95	31.0
Ford, eight.	114	196 11/16	2985	100	29.9
Chevrolet, 2-door ...	115	197½	3085	92	33.5
Naah Rambler .	100	176	2430	82	29.6

Nash's basic aim is to provide a high quality motor car in a small package. Its engineers and stylists argue that a car easy to handle and nimble in traffic will find great favor with the American motoring public. Economy is stressed, too—and the prediction is made that the new Rambler will give 30 to 35 miles per gal to the careful driver.

The new Rambler has a number of features that are not common to a low priced car. Here are a few of them: one piece curved windshield; steering wheel, gearshift lever and directional signal

Turn to Page 112

INDUCTION HEAT

PERMITS 2 OZ. TOLERANCE

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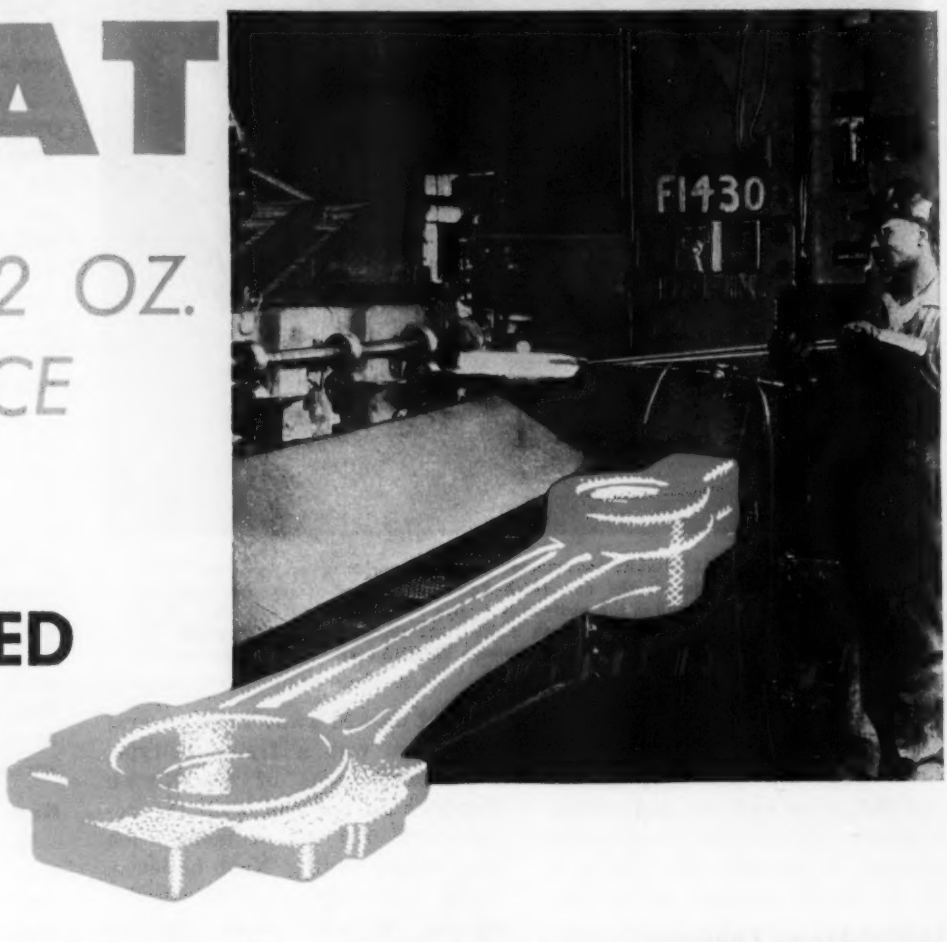

It previously took 8 to 10 drops of a hammer, with slow flow of metal, to achieve close tolerances required for connecting rod forgings. But this leading automobile plant recently combined scale-free, closely controlled Ajax-Northrup heat with improved die design, and pioneered the development of rods *press-forged* at unheard-of production rates.

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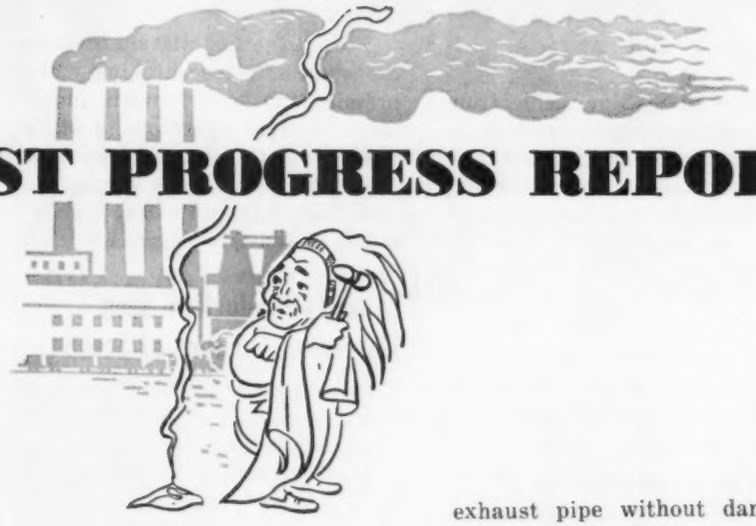
119

WEST COAST PROGRESS REPORT



Boeing holds preliminary road test of truck gas turbine engine ... Scrap market tightening seen ... Company to move.

Digest of Far West Industrial Activity

by J. Reinhardt

Seattle—Successful preliminary road tests of the world's first gas turbine-powered truck, using the experimental Boeing 175-hp lightweight turbine have been completed here, it has been announced by Boeing Airplane Co.

Trial runs of the new 200-lb Boeing powerplant in a ten-ton Kenworth truck chassis have been conducted quietly near Seattle for the past month. The turbine is under development for the U. S. Navy Bureau of Ships.

Test Installation Made

The Boeing gas turbine is similar to the jet airplane engine in its general design, but the tremendous power developed is harnessed effectively by a secondary turbine to turn a shaft rather than being exhausted as jet thrust.

A test installation of the turbine as a power unit for propulsion of a boat is planned for the near future under sponsorship of the U. S. Navy Bureau of Ships. Development installations and further laboratory work will be a continuing program. "Much additional testing and proving have yet to be completed," William M. Allen, Boeing president, stated. "This marks the start of a comprehensive program of service testing, but it should be emphasized that the turbine is not yet ready for production for the general market."

Turbine Truck Quieter

Contrary to public expectations, the new turbine-powered truck is considerably quieter than a conventional diesel truck of equal power. Exhaust gases are approximately the same temperature as those of a diesel or gas truck, Boeing engineers disclosed. At idling power, for instance, it is possible to place a hand over the end of the exhaust pipe without danger of being burned. Exhaust gases are almost invisible and without offensive odor.

The turbine runs equally well on gasoline, kerosene, light or heavy fuel oil and has been tested on "bottled gas." Features of interest to truck and car operators include the elimination of a cooling system, the elimination of much gear shifting, the ability to start and immediately develop full power without the warm-up period common to piston-type engines, and the impossibility of stalling the engine.

The Boeing turbine weighs at least 2500 lbs less than conventional engine installations of equal power, and therefore will provide greatly increased revenue-producing payload space for truck operators, according to John G. Holmstrom, Kenworth's vice-president and general manager.

Weight Reduction

"Our people are genuinely enthusiastic over the potentialities of this gas turbine," Holmstrom stated. "If extended tests prove as successful as these preliminary trials, we can see a great future for this lighter, simpler and more efficient powerplant in trucks, tractors and other mobile equipment."

The big weight reduction of the Boeing turbine, combined with the fact that the new Boeing gas turbine occupies only 13 pct of the space normally taken by the 200 hp gasoline or diesel engine, will make possible certain changes in truck design, such as improved

accessibility and driver's visibility.

The Boeing turbine, aside from small size and light weight, is much simpler in construction than the conventional automotive engine. Although it is a near-sister of the high speed airplane jet engines, Boeing engineers point out that the new "502" operates on the same principle as the familiar ship steam turbine, but uses exhaust gases in place of steam to turn the turbine shaft and generate power.

Gas Drive Transmission

Controls for the gas turbine truck differ but little from those of a conventional truck. Starting is accomplished by a standard auto starter button, which brings the turbine to idling speed. Upon reaching this speed, the fuel valve is turned on and the engine operates on its own.

As there is no direct connection between the engine and the drive shaft, the truck has in effect a "gas drive" transmission, similar to the now familiar "fluid" drive on many cars, except that the fluid is gas instead of oil. A pedal is used for shifting from one gear to another, or for reversing. Speed control comes from the usual foot pedal.

The engine installation includes a system of power braking which promises to be of much importance to truck operators in utilizing the power of the engine itself for braking to a much greater degree than is possible with conventional piston-type engines.

Capacity Production Seen Tightening Supplies of Scrap

San Francisco—With the outlook for steel production in the West continuing throughout the rest of this year at close to capacity levels, a continuing adequate supply of scrap becomes a matter of some concern. Estimates by experienced scrap buyers indicate that the nine principal producers of steel in the West will melt down approximately one and one-quarter million tons of purchased scrap during 1950.

Not Turning Out Scrap

No one expresses concern over the availability of this total tonnage but some producers will probably find themselves unable to secure as much No. 1 heavy melting as they would like and scrapyards are going to find it necessary to improve their segregation practices to meet demands.

Some of the factors affecting the tightening up of the supply of heavy grades of scrap are the practical cessation of shipbreaking; purchases of 10 to 15 thousand tons per month of scrap by Geneva in Utah; capacity operations of the Kaiser Steel open hearths at Fontana; and the anticipated increased demand for heavy scrap from Bethlehem at Los Angeles when its 75-ton electric furnace begins operations the latter part of this month.

In spite of the increase in recent years of metal working plants in the West, they are in general not of the type turning out heavy industrial scrap as in the East. Industrial scrap of the West is largely of light gage material and trimmings which wind up in the form of bundles.

Autos Scrap Source

It is the expressed belief of buyers and brokers alike that there need not be any shortage of scrap in bundles provided they can be properly prepared so as to convince the skeptical purchasers that they are free of contaminants and properly prepared. In southern California alone more than $1 million worth of baling presses have been put in operation since the war and that area abounds in bundling scrap.

The one particularly good source of this material is the large number of automobiles in wrecking yards which are becoming increasingly available for scrap as the demand for parts for old jalopies declines. One handicap to the proper preparation of these autos for the baling presses is the regulation against burning car bodies in the open.

Obviously where burning is impossible there is a tendency to include objectionable material in the bales with result in grief for the open hearth operators.

Scrapyard operators insist that the cost of preparing materials to meet exacting specifications for bales is out of line with present prices offered. However, there are those in the business who seriously doubt that scrap prices on the Coast will move upward in the foreseeable future.

PIPE: Pipe being produced at the Fontana, Calif., plant of the Iron and Steel Div. of the Kaiser Co., Inc. This continuous-weld pipe mill produces 8000 tons of Kaiser plumbing pipe monthly.

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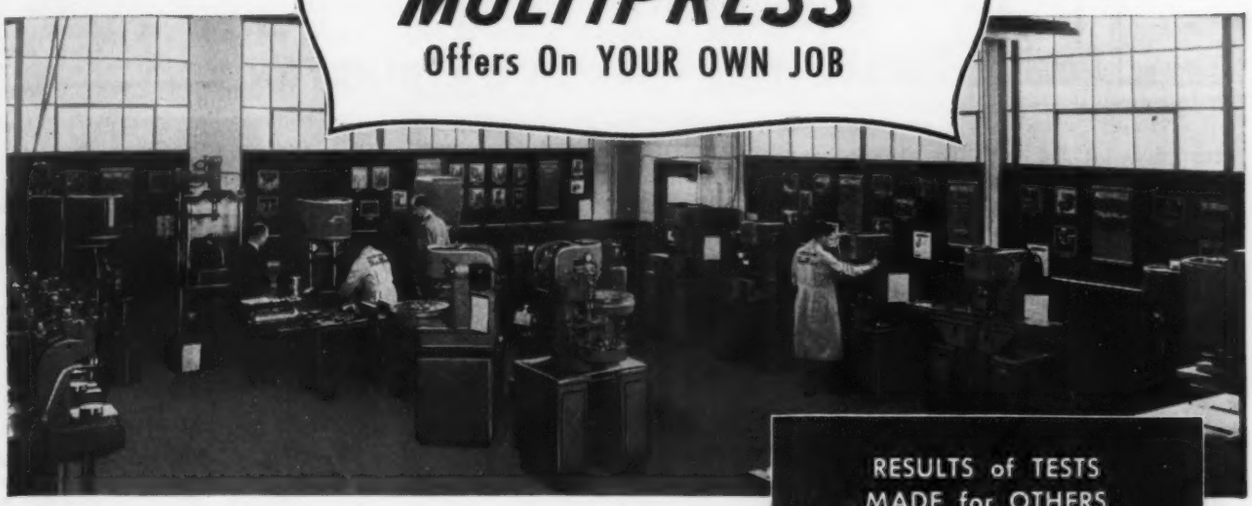

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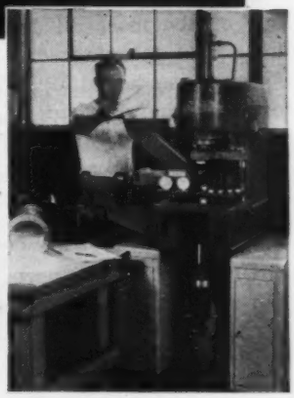

Above: A view of Denison's complete Testing Laboratory, equipped with all sizes of MULTIPRESSES and the extensive line of production - boosting accessories. Located adjacent to a complete Tool and Die Shop, also available to customers needing such service.

At Right: A 4-ton MULTIPRESS equipped with pelleting accessory being used on a test with a customer's dies.

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THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

Gordon Gray assigned task of balancing foreign dollar gap . . . Hoffman sees European exports rising . . . Congress frets over rising unemployment.

by Eugene J. Hardy

Army Secretary Gordon Gray's special assignment to devise ways and means of ending the bothersome "dollar gap" in United States foreign trade may turn out to be one of the most difficult tasks he has yet encountered. President Truman has asked Mr. Gray to coordinate the activities of the various government and private agencies which can contribute to the solution of the problem.

Reversal of Trend Seen

United States exports and imports are now out of balance by about $6 billion. About $5 billion of this is being financed by United States funds under the Marshall Plan and other similar programs. The primary problem confronting the Administration is what to do about trade with western Europe when ECA comes to an end in 1952.

Imports from these countries dropped from $847 million in fiscal year 1948 to $735 million in fiscal 1949. ECA Administrator Paul Hoffman says that this trend will be reversed and that by fiscal 1953, when ECA aid is scheduled to end, imports from western Europe should total about $1.1 billion. However, even if Mr. Hoffman's prediction should be borne out, there will still be a substantial volume of exports over imports.

Investments Best Solution

Mr. Truman is also fearful of the effects of the end of ECA aid on the domestic economy. The presidential memo outlining the problem pointed out that, "if no offsetting measures are worked out, it may well be that United States exports will be sharply reduced with serious repercussions on our domestic economy." The primary problem is to enable these countries to get hard currency by selling more goods to the United States and providing inducements to increase American investments abroad.

It would appear that despite Mr. Gray's efforts to arrive at a solution, the only one that might do the job would be a continued outpouring of American funds. The President hinted at this when he told Mr. Gray that "the resources of the Government" must be mobilized behind this task.

Spending Won't End

What resources has the Government, but the taxpayers' money? In fact, it would seem almost certain that the Administration will have some program of foreign spending ready when the Marshall Plan ends in 1952. It might be an expanded "Point Four" program, or some new high-sounding phrase—the exact title really doesn't matter.

Congress, however, is not going to be receptive to either spending more Government funds or standing by while European imports increase. Even the modest increase in imports predicted by Mr. Hoffman is sure to bring storms of protest, should it come about.

Congress Raps Imports

At the present time, Congress is more concerned about decreasing unemployment and heavy Government expenditures. Every day Congressmen are making speeches about foreign imports resulting in unemployment in particular industries. These protests cover a wide range of commodities including oil, metals, leather goods, glass, pottery, watches and even some agricultural products. For this reason the third postwar round of tariff-cutting sessions to be held in England in September is not setting too well with many members. Additional barriers to American goods

being erected by some of these countries are another important source of irritation.

Rightly or wrongly, Congress believes that growing imports are harming United States industries and causing unemployment. Rising unemployment is a cause for growing concern despite the leveling off which occured last month. In February unemployment reached an eight-year high of 4,684,000. In March it dropped by more than 500,000, a seasonal decline which came about earlier than was expected.

New Labor Problem

Government labor experts predict that by summer, unemployment may reach 5,000,000, largely because the economy is not expanding fast enough to absorb the additional 1.7 million students and other new workers coming into the labor market. The national economy may then be in a somewhat analogous position of reaching new peaks of unemployment while employment is also approaching record highs, possibly 60 million jobs.

That Congress is concerned about unemployment is further indicated by the current flood of measures relating to the problem which have been dropped into the hopper. These include bills calling for $2.2 billion in loans to distressed areas, the Economic Expansion Act, reestablishment of the Civilian Conservation Corps, and one authorizing placement of Government contracts with firms in unemployment areas even though they may not be low bidders. The President has shown his concern last week by again asking Congress to expand unemployment benefits.

Funds for Expansion

Congress will be in no mood to ratify the International Trade Organization and sanction further tariff cuts when close to 10 pct of the available labor force is unemployed. Instead, Congress might give more attention to devising ways and means of facilitating expansion of the economy so as to absorb these workers. Some such stimulation is needed as indicated by figures from the Securities and Exchange Commission. The SEC estimates that expenditures for plants and equipment for 1950 will be down about $2 billion or 11 pct from the $18.1 billion last year. A big decline of expenditures for this purpose is expected in the last half of this year.

It would appear that any solution to the "dollar gap" problem requiring additional United States funds or a substantial increase in imports will not get by Congress with ease. Mr. Gray's job is reportedly largely one of public relations, that is, to create a favorable atmosphere for any new program which the Administration might propose. But selling the public may not be an easy task.

THE BULL OF THE WOODS — By J. R. Williams

HE'S WRONG ABOUT THAT MILLING CUTTER-- AND I'M GOING TO SHOW HIM RIGHT IN THIS MACHINIST'S HANDBOOK!
DAVIE LAD, I WOULDN'T! I'VE KNOWN HIM THIRTY YEARS AND HE KNOWS MORE THAN THAT BOOK-- DO WHAT HE TOLD YOU, SON!
TH' KID THINKS HIS OL' MAN IS OUTA DATE, BUT THAT'S NOTHIN'-- TH' SON OF ONE O' TH' WORLD'S SMARTEST MEN DIDN'T THINK HIS OLD MAN KNEW MUCH, SO HE TOOK THE OPPOSITE SIDE AND WENT DOWN AN' OUT WITH IT-- EVER HEAR OF BEN FRANKLIN'S SON? NO!
OFFICE
4-14 J.R.WILLIAMS
T. M. REG. U. S. PAT. OFF.
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THE LION'S DEN

Seek Funds for Public Power

What the government has already done in the way of public-power systems is but a sample of what the government planners would like to do if Congress would only fall into line and provide the funds. Agencies concerned with such programs have no hesitancy in saying that "public power is not only here to stay but has its biggest job before it."

This is the Interior Dept. way of saying that expansion of government-owned power systems—with statutory preference for tax-coddled cooperatives—is the obvious answer to President Truman's visioned $300 billion economy. To quote William E. Warne, assistant Interior secretary public power "is the key which unlocks the riches of our river valleys and . . . opens the door to full participation in the American way of life."

Keep Private Firms Out

There is an estimated undeveloped potential of about 60 million kw in water power in the United States. The Interior Dept, is urging that at least 25 million kw should be installed by not later than 1965. Of course Interior expects this to be done with government money since it warns that private enterprise "must not be permitted to skim the revenue-producing cream" from hydroelectric projects.

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IRON AGE
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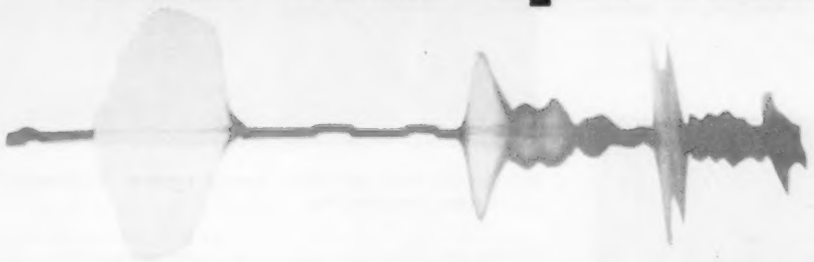
FEATURE ARTICLES

Sonic Tests Spot Flaws



In Heavy Forging

By ROBERT W. SNOWDEN,
Special Engineer
Heppenstall Co., Pittsburgh

Here, for the first time, is a complete pictorial study of sonic testing on heavy forgings. Oscilloscope photos of all types of common defects are included. Heppenstall's 3 years of experience indicates that sonic testing is a must in making quality products of this type.

UNTIL recent years there has always been the serious and unsolved problem of determining the internal soundness of metal parts. The external inspection of a product can be of little value if internal defects cause it to fail in service.

Inspection is one of the most important steps in any manufacturing process. In all inspection work there are two classifications of product: Material to be shipped and material to be rejected. In the case of the mass production of small, more or less inexpensive parts where inspection is done in many cases by automatic machinery, the two classifications are probably sufficient. However, the forging industry, which produces expensive tailor-made products, has been faced with a third classification—the border-line case.

This classification cannot be avoided due to the rigid specifications concerning alloys, hardnesses, and physical properties. Generally speaking, in the case of medium and heavy forgings, the designing engineers incorporate high enough safety factors into the design to make it possible, in many cases, for the customer to accept these so-called border-line cases even though they are slightly outside of specified limits.

Forgings are quality products and the advent of the sonic test to this industry is of vast importance to the forging industry and users of forgings. Sonic testing can only be explained pictorially and therefore must include examples which, under normal circumstances, would not be brought out for public inspection.

In a great many cases, the user of this type of forgings may spend far more in die sinking or finish machining than for the die block or the rough machined forging. The use of sonic inspection means that faulty material is discovered and replaced by the manufacturer of quality forgings. Therefore, a knowledge of the internal soundness of such products cannot be overestimated.

Sonic testing has done not only a remarkable

job in the discovery of internal defects which are too deep to be located by any other known method, but it has also been of considerable value in overall *quality control* throughout the plant. The fact that sonic test equipment is being handled by competent operators in intermediate or final inspection has a definite effect on personnel.

Many times metallurgical inspection of material which has been destroyed to gain further knowledge of this method of testing has pointed

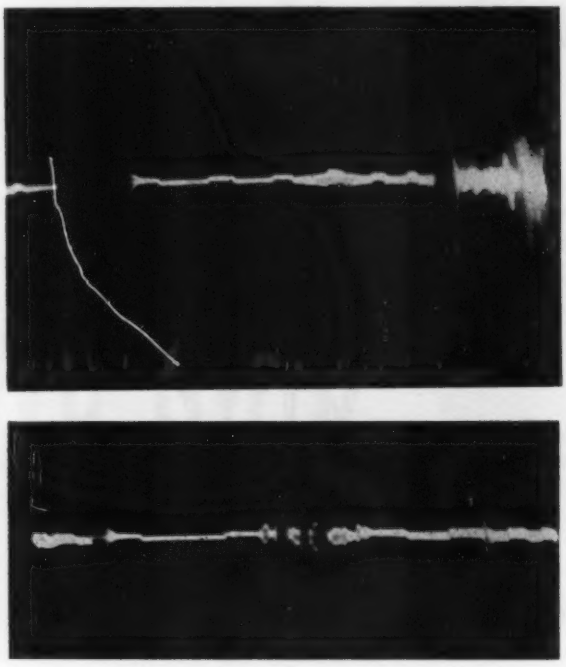
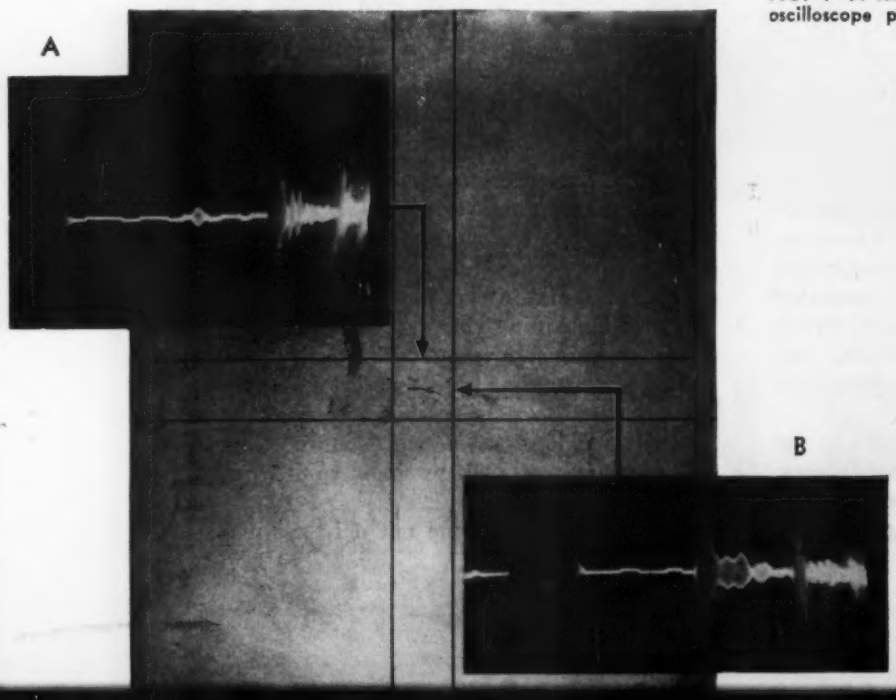


FIG. 1—Oscilloscope photos of typical defects. Top photo is typical of segregate, bottom is a photo of a crack.

FIG. 2—Sonic test taken in two directions through the defect. A is a oscilloscope photo of the defect taken from the top face parallel to the sound beams, B is taken from the side face perpendicular to the sound beams.



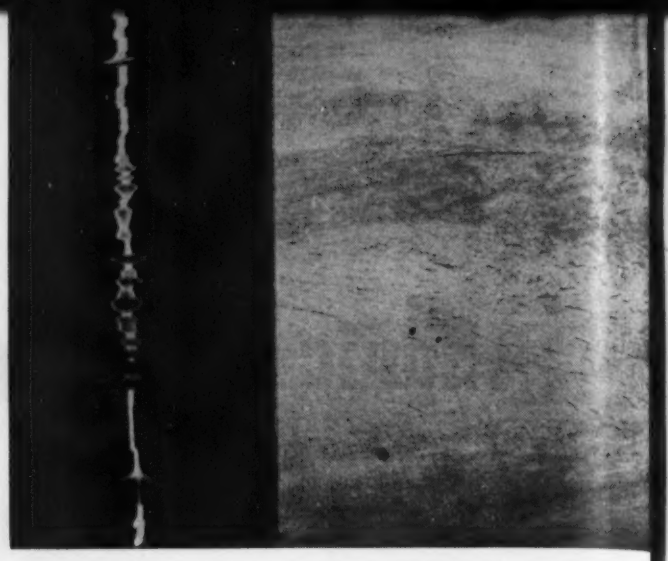


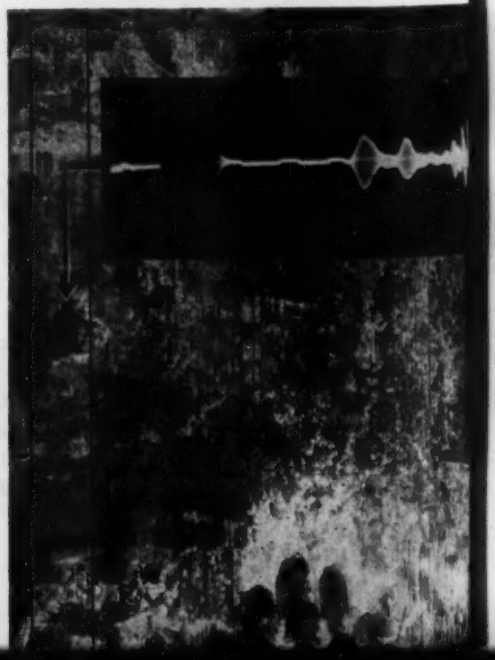
FIG. 3—Die block containing thermal rupture. Oscilloscope photo taken from the top.

a finger at flaws in manufacturing procedures. In other instances, it has been possible to control the quality of steel purchased by a careful check of the quality of the finished product made of purchased steel as compared to steels manufactured in our own plant. In some instances, the sonic test has brought about complete changes in manufacturing procedures due to the discovery of internal defects which were not known to be present and were found to be due to fundamentally wrong manufacturing methods.

There are several electronic nondestructive testing devices on the market which have become important factors in the determination of the location, the size and the cause of internal defects in forged or cast metal products. The Supersonic Reflectoscope, manufactured by Sperry Products, Inc., is the instrument used by Heppenstall. This equipment has stood up quite well under mill conditions even though it is a somewhat delicate electronic device.

Two and a quarter megacycles is sensitive enough to pick up any defects from segregates

FIG. 4—A large hole in the die block and accompanying oscilloscope photo.



to gross defects in die block testing, except in extreme cases. At two and a quarter megacycles, a difference between segregates or nonmetallics and hairline cracks can be noted on the oscilloscope as noted in Fig. 1. However, interpretation in some of these cases is difficult.

A ground surface on the piece to be tested is not a necessity although the quality of the surface has much to do with the quality of the test. On die blocks, a surface produced by a 0.090 in. feed on a planer or a surface produced by a good milling cutter is sufficient for a good production test. A forged surface is usually not satisfactory for testing this type of material.

When properly handled, the type of testing equipment used can locate very small defects within ⅛ in., if the distance through is not more than 2 to 2½ ft.

The life of a 2¼ megacycle searching unit is approximately 700 to 800 hr on flat ground surfaces. This life is markedly reduced when used on a planed or milled surface to approximately 80 to 100 hr. Even though the quartz crystals in the searching units are ground to a certain frequency, they can be worn very thin and still be usable providing an accurate method is used to closely control the sensitivity of the instrument at all times.

In order to control the sensitivity of the instrument without regard to dial setting, it was necessary to make a test block of unquestioned quality but of coarse grain structure. The coarse grain of this block will show on the oscilloscope at high gain. We consider the normal gain, the point at which the indications of this coarse grain disappears from the sweep as the gain is slowly backed off. In this manner the instrument can be set at a constant sensitivity even though the sensitivity of the instrument, or the searching unit, has tapered off from many hours of use.

High frequency sound waves are directional. The higher the frequency the straighter the beam. For this reason, if there are any doubts tests must be made from a surface 90° from the first test, as in Fig. 2. The defect looks far less serious in the side test than it does from the top due to the reflecting surface being greater when the defect is perpendicular to the sound beam.

Many sections of a given product must be cut and etched before reliable information can be gained as to its characteristic defects. Figs. 3, 4, and 5 show some defects found in die blocks and what they look like on the oscilloscope. Die blocks are ideal for sonic testing. They are fine grained, have parallel faces and a good surface. These forgings have been tested on a production line basis for the last five years at Heppenstall. Approximately 100,000 such forgings have been tested.

Sonic testing of miscellaneous forgings was begun at Heppenstall in 1947 after several thousand hr of testing experience on die blocks. Each forged shape has different characteristic defects.

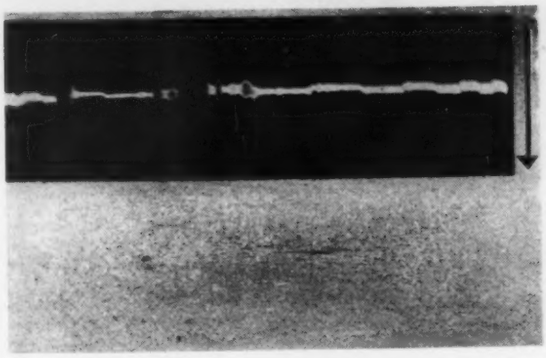


FIG. 5—Centerline defects in the die block. Oscilloscope photo is typical of this condition.

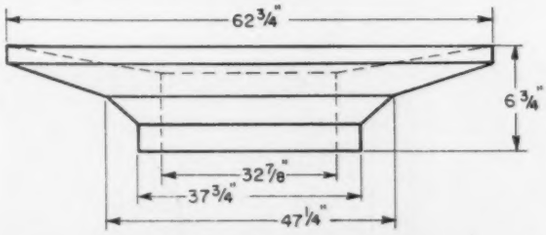


FIG. 6—Compressor wheel shape which does not lend itself to sonic test. Illustration not drawn to scale.

FIG. 7—A pinion forging being tested from end to end.

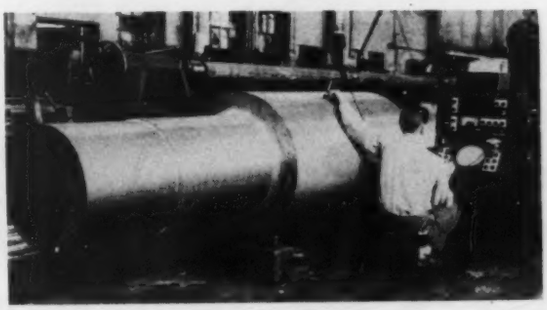
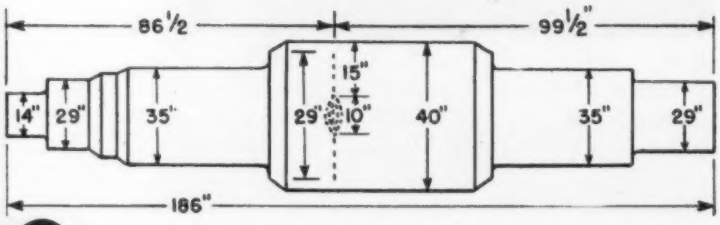


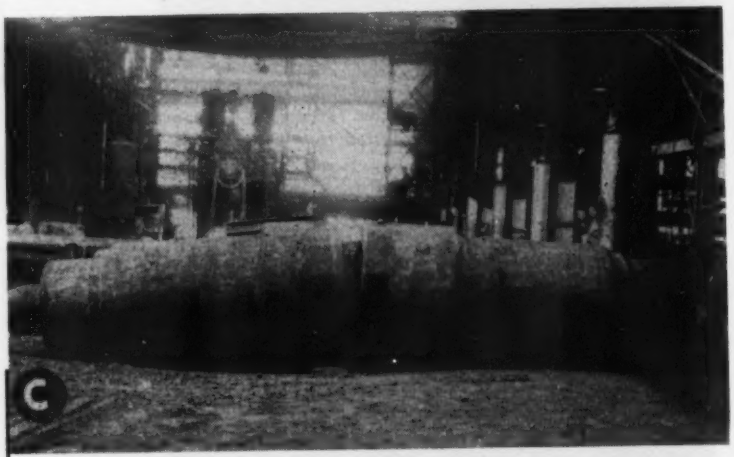
FIG. 8—A pinion forging being tested diametrically along round strips on the roll face.

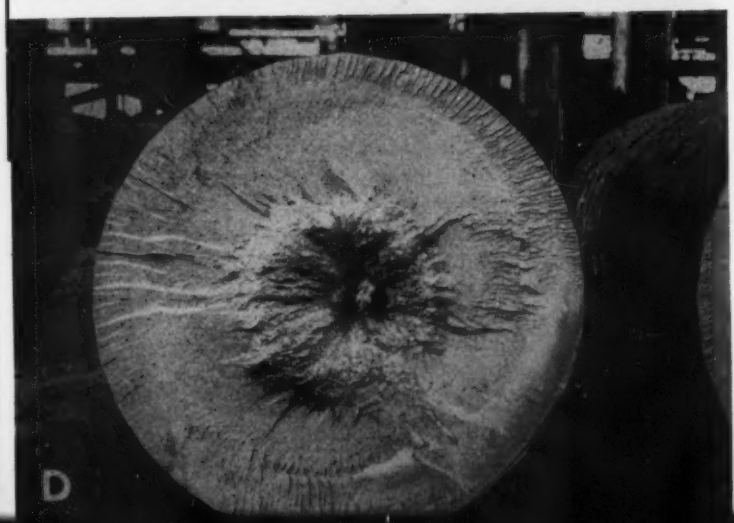
These defects may be due, not only to problems in melting practice or ingot practice, such as ingot size and shape, temperature and pouring rates, but to problems in the production of certain shapes under a hammer or press. All of these factors are related to the behavior of alloying elements in various combinations. Such problems are not new in the forging industry. Until



A

FIG. 9—A sketch of a shaft showing the defect, A after sonic test, B marked for breaking, C after breaking and D fracture of the shaft confirming the defect originally found by sonic testing.





recently, however, there has been no known method of determining the location, size and approximate shape of deep-seated defects until forgings have either failed to hold together in their normal process of manufacture or have failed in service. Often large sums of money had been spent in finish machining and the installation of intricate machinery completed before service failures were encountered in the defective parts.

In many cases, the shape of the forgings do not lend themselves to the test. Figs. 6 and 7 illustrate shapes which do not lend themselves to the sonic test. Fig. 6 shows the drawing of a compressor wheel which has no side parallel to another in a straight line. In such cases, the reflection from the other side is lost because the sound waves do not come straight back but are cast off at an angle to the reflecting surface.

A production test should be one which can be made rapidly and yet is sufficiently accurate to give a complete story on the interior of the forging. In the type of forging shown in Fig. 7 the test is very important. If a good back reflection is obtained from the opposite end, and this back reflection is maintained while going over an entire end surface, there is a good chance of finding the forging sound upon subsequent testing. In some cases, the diameter of the end of the forging is much smaller than the main body diameter. In testing these, it is necessary to test through the main body at the setdown or largest draw. It is necessary, also, to know that reflections are usually received from most of the setdowns or small diam sections on a shaft. Careful measurements must be made in this type of test in order to determine which reflections are setdowns and which one represents the opposite end of the forging.

In the testing of shafts having many setdowns, this can be confusing. It is a great help to have two identical shafts to check one against the other. If the reflection pattern from the end check of both is identical, the possibility of there being a major transverse flaw is eliminated. To make sure there are no defects in an axial direction and because sensitivity decreases with distance, the piece is tested diametrically the full length along two strips 90° apart as shown in Fig. 8.

In most cases, roll forgings are rough turned and it is necessary to grind these strips along the sides of the piece using a 9 in. hand disk grinder of the type commonly used in automobile body shops.

To illustrate the accuracy with which gross defects can be located and plotted as to size and shape, Fig. 9 shows a sketch of a shaft showing the defect plotted after sonic test, the marking on the outside of the piece locating the internal defect on the length, the piece after breaking and finally the fracture. Fig. 10 shows another shaft as laid out on the standard test form, and

HEPPENSTALL COMPANY
SUPERSONIC TEST
FORGINGS AND BILLETS

DESCRIPTION Union Shaft TIME
Smooth forged
Rough machined ✓ CONDITION OF ENDS
Finish machined or ground Sawed ✓
Machined
CUSTOMER I E & Co.
ORDER No. 68059
HEAT No. 3
PART No. 310241
DATE 9/14/5-
DATE 10/6/48
CLASS OF TEST
End surfaces only
End surfaces and two strips ✓
All suitable surfaces
REMARKS 1 1/16 1/2 M 1
OPERATOR WBP

FIG. 10—Standard test form for sonic testing with defects indicated. Illustration below shows the defect after breaking the forging.

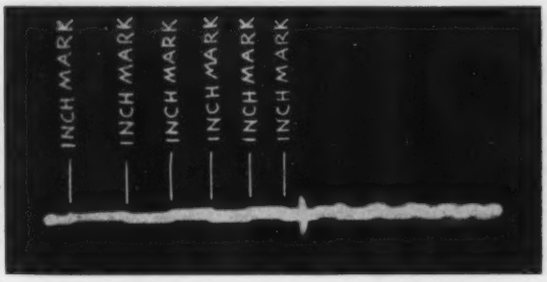


FIG. 11—Oscilloscope photo of gross defect at 5½ ft from the end of a shaft 15 ft long. One of the most important advantages of this equipment is that each squared section of the sweep, or inch mark, denotes an accurate unit of length. These inch marks are indicated above and they permit precise location of the defect within the forging.

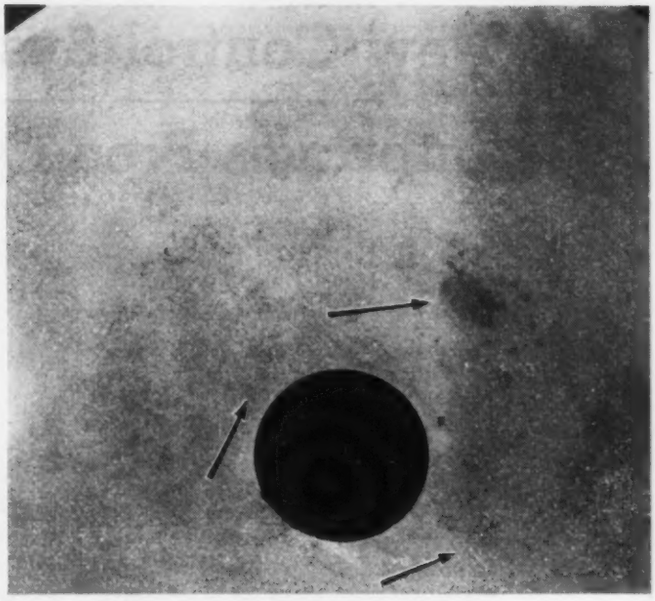


FIG. 12—Etch test showing porosity around the bore of a 12-in. diam flange of a rotor shaft.

shows this shaft after breaking. It is not difficult to see from the photographs that the type of gross defect pictured can be accurately located. Fig. 12 shows an oscilloscope photograph taken after the discovery of a defect of this type 5½ ft from the end of a shaft 15 ft long. The reason for the reduced size of the back reflection is the ragged nature of the defect. The reflecting surface inside the piece is so uneven it reflects sound waves in many directions, making it possible for only a few of them to be beamed straight back to the 1-in. sq searching unit.

Generally speaking, all heavy forgings are products calling for the highest quality. The Heppenstall Co. puts forth every effort to make each forging a perfect forging. In some cases, however, specifications are far more rigid than in others. Tiny defects in vital areas may be cause for rejection and everything possible must be done to accurately locate and interpret indications in any portion in which the sound waves are not normal.

Abnormal structures, which disturb the normal passage of sound through the piece and back again, may be coarse grain structure, highly segregated areas, porosity, very small cracks, or even small holes in the otherwise solid metal. Such defects may be confined to small areas and are very difficult to interpret from the standpoint of type of defect and whether or not its presence in the piece in that particular area is serious. Fig. 12 shows porosity located in the flange end of a rotor shaft from the bore to 3½ in. out from the bore, testing from the outside diameter to the bore. Defects of this nature can only be accurately located and interpreted by 100 pct test of the surface. Part II of this story will appear in THE IRON AGE, April 27th issue.

New Control System

Improves Pipe Quality

By D. A. EVANS
Supervising Engineer,
Products Engineering Dept.,
National Tube Co.,
Pittsburgh

A multiple correlation method using routine tests analyzes the effects of materials and methods on pipe production. Three variables—carbon, manganese and wall thickness—give a quick statistical check on quality.

THE application of mathematical statistics to steel plant problems has steadily increased. Experimental work is now designed so that the data obtained may be analyzed statistically to determine the effect of materials used and of the manufacturing procedure on the strength and performance characteristics of a product.

One familiar with the influence of the variables can use this method as a short cut to obtain a close approximation of their effects on the final product, and thus avoid a much longer and more involved procedure. The results obtained will be identical for all practical purposes.

The method outlined in this article is a practical example of such a procedure in which the influence of carbon, manganese, and pipe thickness on physical properties of the steel are determined.

The procedure is used in line pipe analysis and may also be applied to any problem where the correlation of factors influencing manufacture are required.

Multiple correlation, an approximation method,[1] consists of the measurement of the relationship between a dependent variable and one or more independent variables.

The correlation in the form of regression curves may be established by the following procedure after first determining which of the possible independent variables are most likely to influence the multiple correlation.

As an example of the use of this technique, assume the problem is to find which of the independent variables affect the elongation of line pipe; also the correlation of the variables based on test data covering a wide range of sizes and thickness of pipe.

The variables having a possible influence on the elongation of the grade of steel from which the line pipe is made are those determined by chemical analysis and dimensional requirements.

In the former, since one is dealing with a carbon steel, there are significant variables; namely, manganese (M), and carbon (C), and under the latter thickness (t). These are found to be of greatest possible significance.

The relationship is $E = K\, f(C) \cdot f(M) \cdot f(t)$

Where E = percent elongation in 2 in.

K = a constant to be determined

f(C) = a function of C showing the proportion in which E varies with C

f(M) = a function of M showing the propor-

TABLE I

CELL LIMITS													
0.165	0.175	0.185	0.195	0.205	0.215	0.225	0.235	0.245	0.255	0.265	0.275	0.285	0.295
CELL MID-POINT													
0.170	0.180	0.190	0.200	0.210	0.220	0.230	0.240	0.250	0.260	0.270	0.280	0.290	
92.3	ENTER VALUES OF ELONGATION AS A PERCENT OF THE AVERAGE ELONGATION IN THESE COLUMNS FOR EACH CORRESPONDING CARBON VALUE.												
ENTER AVERAGE OF EACH COLUMN													

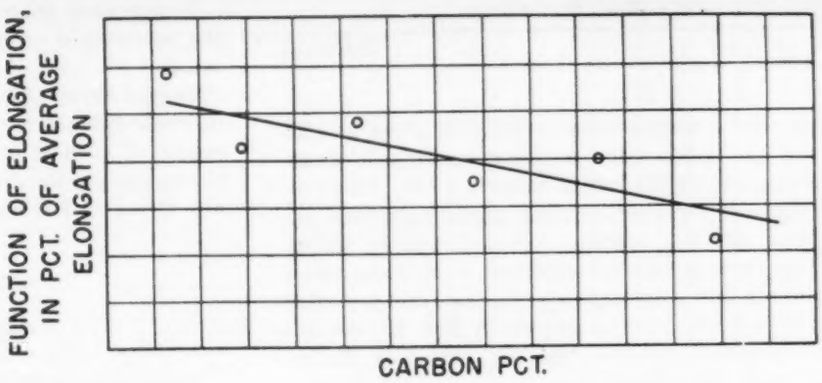


FIG. 1—Trend line derived from a scatter diagram of carbon v. elongation.

tion in which E varies with M

f(t) = a function of t showing the proportion in which E varies with t

The procedure is as follows:

(A) Tabulate individual average values for elongation, carbon, manganese and thickness given in the laboratory or mill test reports in their stated relationship, extending the table to include any pertinent information such as date of manufacture, size, weight per foot, etc.

(B) Find the summation Σ of the elongation values and divide by the number of observations to obtain the average elongation obtained under test.

(C) Divide each individually recorded elongation value by the average value to obtain the percentage each value E_o is of the average.

Find the summation of these values = Σ_o

The values obtained by procedure (C) are to be plotted against their corresponding tabulated carbon, manganese and wall thickness values resulting in three separate curves depicting the elongation per cent as a function of each of the three stated variables.

Where the number of observations is few, the individual values may be plotted, but where the number is large, resort may be had to a grouping procedure. In either case the plotted points represent a scatter diagram which will indicate a trend to which an average line or curve drawn through the points may be adjusted.

Here is an Example Grouping of Carbon vs Elongation Values. Assume the total range in 80 observed carbon values as given in the test reports to be 0.170 to 0.290. The difference is 0.120.

Reduce the 80 observed values of carbon which it is required to plot against elongation by dividing the difference of 0.120 into a suitable number of cells, say 13 cells having a limit of 0.010 carbon, as shown in Table I.

Enter the individual elongation values obtained by step C in their proper cells as defined by the carbon value listed against the per cent elongation value.

For instance, if the per cent of average elonga-

[1] *Based on Exekiel — Methods of Correlation Analysis, 1930 Edition—Chap.* 14.

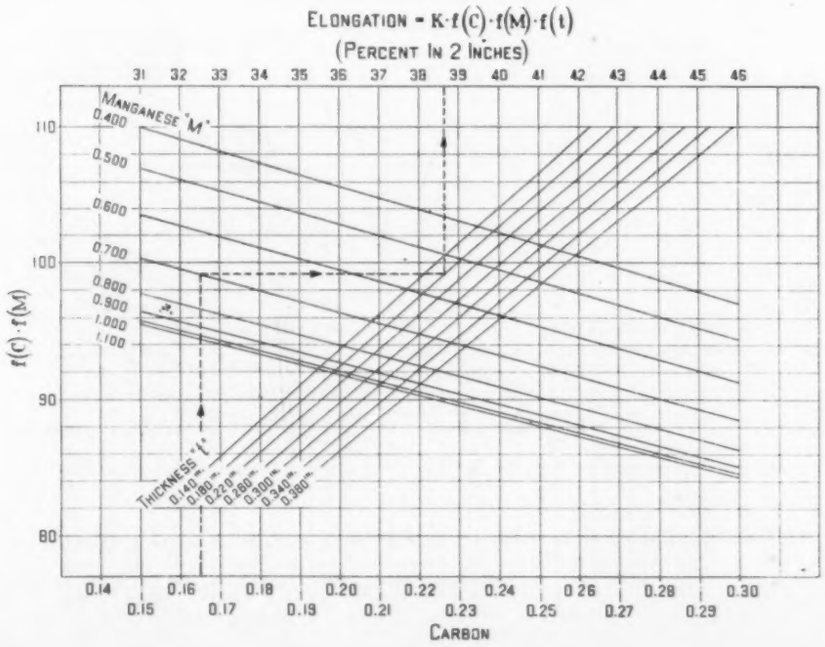


FIG. 2—Effect of the variables on elongation.

tion for a carbon value of 0.173 is given as 92.3 pct, the latter value is placed in the cell whose limits include the carbon value of 0.173. This procedure is repeated until all values have been entered and the average for each column found. This average under each column is plotted against the cell mid point value for carbon, and a scatter diagram obtained, as shown in Fig. 1. An approximated average line or curve is drawn through the scatter, thus indicating the trend.

The same procedure is followed in preparing a scatter diagram and trend line for elongation vs manganese and for elongation vs thickness.

Relating the 3 Variables to the Independent Variable—(a) Elongation vs Carbon—For each carbon value by test listed in the tabulated data, read off from the trend line, the corresponding value of the function of the elongation expressed as a per cent of the average elongation and enter the values obtained under a column headed $f_1(C)$, the subscript figure indicating the first of such approximations.

In like manner obtain and enter the values for elongation vs manganese and for elongation vs thickness under their respective columns headed $f_1(M)$ and $f_1(t)$.

Find the product (in each of the 80 observed values) of $f_1(C)$, $f_1(M)$ and $f_1(t)$ and also the summation of the product values $= \Sigma_1$.

Obtain the Constant K_1 for the first approximation by dividing Σ_0 by Σ_1.

Multiply each product of $f_1(C)$, $f_1(M)$ and $f_1(t)$ by the constant K_1 to obtain the first approximated value of function of the variables $= E_1$.

Divide each value of E_0 by E_1 and determine the deviation d of each resulting value from the mean.

Standard Error of Estimate—Enter the deviation of each value from the mean d, then find the square of each of the deviations and the sum of the squares of the deviations to obtain the Standard Error of Estimate.

$$S_Y = \sqrt{\frac{\Sigma d^2}{N}}$$

d = deviation from mean

N = number of observations

The values of E_0/E_1 obtained are grouped by placing in their respective carbon, thickness and manganese cells, and the average found for each cell is then multiplied by the value of function of elongation obtained from the curve for the corresponding cell mid point value. This value is then plotted (on a separate sheet) against the cell mid point value for carbon, manganese and thickness to obtain scatter diagram and trend lines.

From this point on, the procedure of "Relating the 3 variables to the independent variable" is repeated until adjustment obtained in the standard error of deviations of E_0/E_n from this mean is negligible.

When the best fitting curves are obtained K for the final equation is obtained by multiplying K_n by E_0.

$E = K \cdot f(C) \cdot f(M) \cdot f(t)$—A chart is obtained by using the individual trend lines for carbon, manganese and thickness found to give the best approximation, as follows.

Using the mid point values for carbon previously given, find from the trend line for the carbon curve, the corresponding values of the function of the carbon f(C).

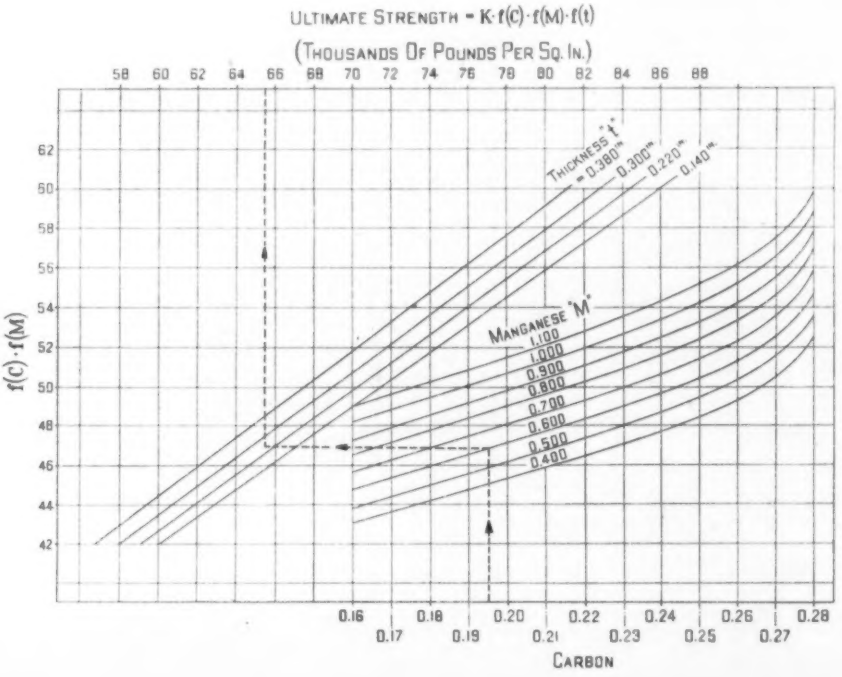


FIG. 3—Effect of the variables on ultimate strength.

TABLE II

VALUES OF f(C)-f(M)

Function and Cell Mid Point of "M"	Carbon Mid Point	f(C)	f(C) · f(M)		f(C) · f(M)		f(C) · f(M)
	0.17						
	0.18						
	0.19						
f(M)	0.20			f(M)		f(M)	
= 68.4	0.21			= 69.7		= 71.1	
WHERE	0.22			M = 0.500		M = 0.600	
M = 0.400	0.23						
	0.24						
	0.25						
	0.26						
	0.27						
	0.28						
	0.29						

Table must be expanded to the limit of manganese cell mid point values.

Multiply each of the values f (C) thus obtained by the function of the manganese read from the manganese trend line for each manganese cell mid point value. Table II suggests how such a chart should be arranged.

Divide the full range of f (C) • f (M) values obtained into any smaller number of values which will cover the range suitably on the graph paper used. Then plot each of the values of f (C) • f (M) obtained against the corresponding carbon cell mid point value. This procedure results in a separate curve for each of the f(M) values tabulated.

Prepare a table relating the elongation E to the three functions by establishing cell mid point values covering the range values of f(C) f(M) and multiply each of these mid point values by the function of thickness obtained from the trend line for each of the thickness cell mid point values. This procedure also results in a separate curve Fig. 2, for each of the thickness cell mid point values.

The chart is read by selecting the carbon value desired, reading perpendicularly to the desired manganese value, and horizontally to the desired thickness value, thence perpendicularly to the elongation value.

Charts showing the relationship

$U = K \cdot f(C) \cdot f(M) \cdot f(t)$ where U is ultimate strength and,

$E_r = K \cdot f(C) \cdot f(M) \cdot f(t)$ where E_r is elastic ratio

are also obtained by following the same procedure. These relationships are plotted in Figs. 3 and 4.

ACKNOWLEDGEMENT

The author is indebted to W. O. Clinedinst, Director of Research, for suggestions in the preparation of this paper.

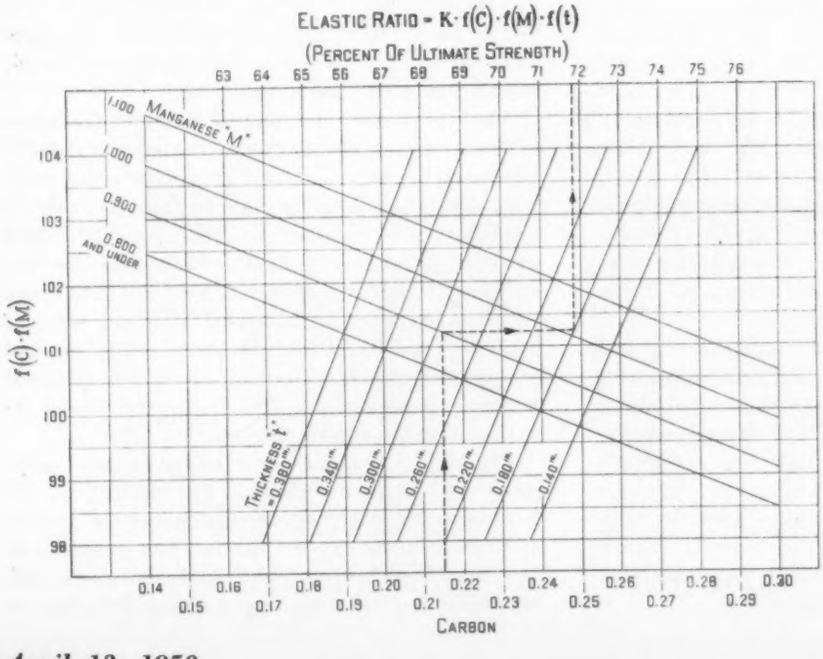


FIG. 4—Effect of the variables on elastic ratio.

How to Repair Tools by

ATOMIC HYDROGEN WELDING

Atomic hydrogen arc welding salvages broken and worn tools and dies. Welding without destroying heat treated properties is solved by the high-temperature shielded flame. The process also permits economical fabrication of new composite dies by welding tool steel onto less costly base metals.

By R. J. TIERNEY, *Pres.*
Storts Welding Co., Inc., Meriden, Conn.

ATOMIC hydrogen arc welding permits welding of tools and dies, a specialty application not widely used. This repair technique is responsible for important savings in many metal fabricating plants. From the salvage point of view, the parts welded are generally made of expensive alloy steels that have been given a considerable amount of machining. They, therefore, represent a large investment. On new work, the fabrication of composite dies by welding tool steel working areas onto less costly steel bases not only saves money but often produces a more satisfactory die.

The process performs satisfactorily on tool and die work because the arc is smooth, quiet and uniform. The envelope flame is always there, protecting the molten pool. The flame temperature is so high that most jobs are completed without putting very much extra heat into the base metal. There is no porosity since deposits are dense and fine-grained. Filler metal is bare rod, usually some form of drill rod, available from regular steel supply sources.

For the most part, welding on tools and dies is a building-up operation. Joints generally are not involved. Also, the amount of metal deposited is quite small. This would be extremely simple welding on mild steel or cast iron.

The problem in the case of tool and die steels is that the part has been heat treated to a definite hardness. A reheating cycle as drastic as welding will cause some change in the hardness in areas near the weld zone. The atomic hydrogen arc is so hot that it is possible to localize the heat sufficiently that not too much heat is transferred into adjacent areas. Because the heat affected zone is small, care must be exercised to prevent it from being chilled too rapidly by the adjacent mass of base metal. This is accomplished by preheating the entire piece.

Preheating requires the exercise of some judgment. If it is insufficient, the chilling of the heat affected zone will cause underbead cracks. If preheating is carried too far, the hardness of the piece will be reduced. Although the hardness can be restored, the working principle is

FIG. 1—Defects appearing in large chuck sections after machining have been repaired by atomic hydrogen arc welding.

that it is best to complete the welding operation with the least possible metallurgical disturbance to the piece. Small parts can be preheated with a welding or blow torch. Larger pieces are better heated in an oven. An oven always can be improvised with firebrick and asbestos paper.

Selection of welding rod is not based entirely upon the composition of the base metal. It is more important to be sure that the deposit when heat treated will match the properties of the base metal, and that it will take the same heat treatment as the base metal. The objective in tool and die welding is to lay down a deposit which, when given the proper heat treatment, will: (1) Show approximately the same combination of hardness and toughness as the base metal; (2) be free from porosity; and (3) have a fine grain structure. All of these qualities contribute to long tool life. Selecting the right filler metal is half the answer. The atomic hydrogen arc in the hands of a skilled operator will do the rest.

The range of alloy steels from the plain high carbon to the chrome-moly steels used for hot work can be successfully welded. All water-hardening, oil-hardening, and air-hardening steels that are high in carbon and chromium can also be welded. The last mentioned type is susceptible to checking and requires higher preheat temperatures.

The best control of heat distribution is obtained with small deposits. Holding the heat close to a uniform level throughout the welding helps prevent checking, though it definitely does not take the place of preheating.

Most plants find that breakage accounts for very little of the tool and die work that comes into their shops. Worn working areas are much more common. There are also many dies that come in for alterations because of changes in product design. Even in cases where the changes are slight, precautions must be taken to guard against porosity and underbead cracks.

In addition to the maintenance applications, atomic hydrogen arc welding is useful in the fabrication of composite dies. A relatively low cost machine steel can be used for the body of the piece, with the working area or edge formed by a deposit of the most suitable type of tool steel.

A group of large chuck sections were found to contain a number of defects after machining, as shown in Fig. 1. Some of the repaired spots in the as-welded condition can be seen in the photograph. However, after finish machining there was no perceptible trace. A die-casting die, with a groove running from the left edge to the center which had to be filled, see Fig. 2A. Because of the mass of the piece and the nature of the base metal, careful preheating was necessary. The

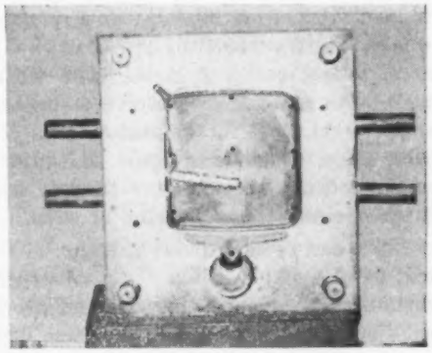


FIG. 2A—A groove running from left edge to the center of this die-casting die had to be filled.

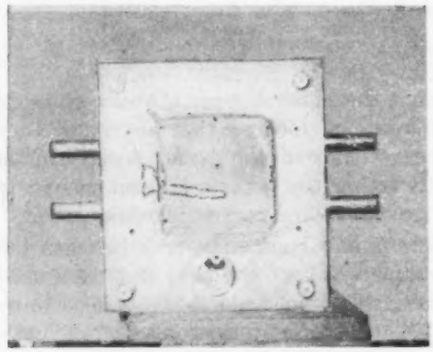


FIG. 2B—The completed weld is shown on the die before being finish machined.

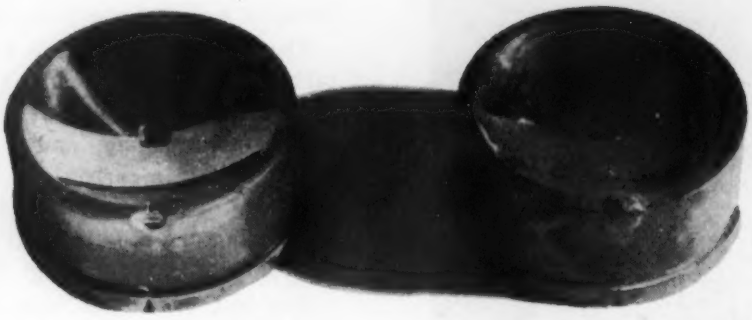


FIG. 3A—A small cavity in the edge of this plastic molding die required filling.

FIG. 3B—The completed weld is shown on the die before being finished ground.

die was set over a multiple-flame gas burner and covered with asbestos, so that it could be evenly brought up to heat. Fig. 2B shows the completed weld. Filler rod containing 0.40 pct carbon, 5 pct Cr, 0.35 pct V and 1.35 pct Mo was used.

A hot forging punch, 1 in. diam and tapered on one end to ⅝ in. was repaired. For this application a hard facing metal that holds its hardness at elevated temperatures was used. For a distance of about ¼ in. from the end, No. 1 Stellite was applied. The remainder of the taper was faced with No. 12 Stellite. The No. 1 is tougher and harder. It is used where it will take most of

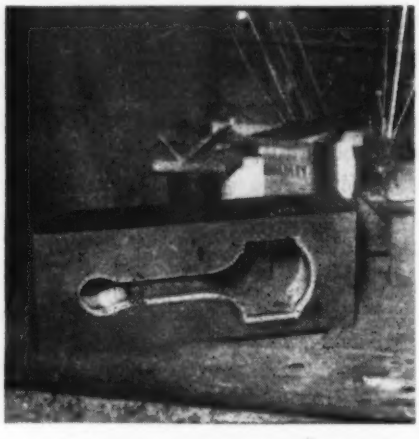


FIG. 4—This trimming die was fabricated as a composite unit through welding.

the blow and the hardest wear. About ⅛-in. is deposited over the face of the taper and then smoothed carefully with the flame. A sheet metal gage tells whether the deposit is deep enough to be finish ground to the correct working size.

There is one important difference between the hard facing material and the alloy steel rods used on most jobs. The tool and die steels need to be heat treated to bring out their maximum hardness. They can be finish machined while in the annealed condition. The hard facing metals have their full hardness in the as-welded condition and require no heat treatment. They are too hard to machine readily and are therefore finished by grinding.

The base metal on these punches was a tool steel rod of high hardness. The punches were preheated to 500° to 600° F before welding. For easier handling they were inserted in the end of a short section of tubing and made fast to it by a set screw. The assembly was then laid across two V-blocks. This enabled the operator to turn the work by turning the cool end of the tube. The section of heavy tube in front of the welding setup served as a support for the punch. The hard facing material was applied to the end and the deposit given a final dressing with the atomic hydrogen flame. Then the punch was cooled slowly in mica.

In the case of a plastic molding die, shown in Fig. 3, it was necessary to fill a small cavity on the edge of a die. This is not just a matter of preheating and depositing a few drops of filler metal. The difficulty in repairing these plastic molding dies lay in the fact that great care had to be taken to get them clean and to be sure that there was no film that would bubble up into the deposited metal and cause porosity. If the surface is cleaned with the proper solvent there should be no difficulty.

A trimming die base designed as a composite welded fabrication is shown in Fig. 4. This base was made of a relatively low cost, easily machinable, tough, resilient steel. The working edge had been grooved to receive a deposit of the proper tool steel for longest wear and best service. The result was a die that did the work and stood the shock better than if it had been made entirely from one kind of steel.

Little can be said about selection of filler metal and details of procedure. Actual experience determines the proper material and procedure for each size, shape, and composition. It is a case of studying every job, watching the heat effect as the work progresses, and adapting the best procedure for the conditions.

Special Burner Converts Gas Furnace for Oil

By G. J. GOLLIN
Director, Fuel Oil General Technical Section, Shell Petroleum Co., Ltd., London

British designed Y-type burner permits the combustion of fuel oil in furnaces originally designed for natural gas. Design considerations were combustion characteristics, furnace space requirements, flame sizes, burner clogging clearances, and fuel-feed turn-down ranges.

A BURNER designed for the combustion of fuel oil in furnaces originally designed for natural gas has the following characteristics: (1) A turn-down range from 20 to ½ lb of oil per hr; (2) small physical dimensions so that the burner can be mounted in the space normally available for a gas burner; (3) internal oil and air passages of sufficiently large dimensions to avoid clogging of the burner even when the burner is subjected to a high degree of radiant heating; and (4) a flame capable of being directed down existing small primary combustion chambers designed for use with gaseous fuel.

The development of the burner required a study of: (1) The burning characteristics of oil as compared with gas; (2) furnace space requirements; (3) fuel and air clearances necessary to avoid burner clogging; (4) flame sizes and angles; and (5) fuel-feed turn-down ranges. The Y-type burner evolving from this experimentation has been awarded British Patent No. 539877, see Fig. 1.

The problem of control was solved in two ways. Both involve the use of small high quality valves of the V-groove type that are capable of being set to pass small quantities of oil without clogging.

In the first method a volumetric metering pump is employed to serve a bank of several burners, the metering valves being merely used to insure equal distribution of the constant volumetric output of the pump. The second method is to insure the arrival of the oil at the metering valves at a constant pressure and viscosity, and to use the valve itself as the metering device. These V-groove valves, although offering a larger orifice than needle valves, present a relatively small passage to the oil. For this reason their use is of little purpose unless they are protected by a strainer of not less than 100 mesh.

With light distillate oils, fabric cartridge filters can be employed. Constant pressure at the burner is obtained by the use of a normal internal gear pump. The delivery pressure of the pump is controlled by a pressure regulating valve that is insensitive to variations while fuel delivering to the burners. When the discharge to the burners is a large portion of the pump's

capacity, the best valve is that in which the controlling orifice is manipulated by a diaphragm.

The burner, Fig. 2, is made up of an inner oil tube surrounded by the annular duct introducing the atomizing medium, compressed air. Oil is introduced into swirl chamber A through duct B, the oil being at a pressure slightly higher than that of the atomizing medium. Air is introduced into the swirl chamber through three tangential grooves C1, C2, C3 cut in the conical face of D. The fuel and air rotate and mix in the swirl chamber A and leave by the final orifice E. The final orifice is large enough to avoid chokage of the burner when firing small oil capacities in hot combustion chambers.

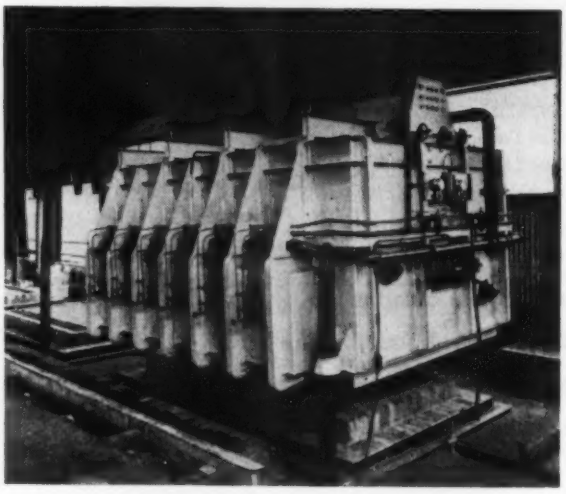


FIG. 1—Typical installation shows six Y burners fitted to a portable furnace.

The burner operates satisfactorily at air pressures between 3 and 10 psi, and at oil pressures about 1 psi higher than the air pressure. A differential between oil and air pressures prevents an unstable flame.

Constant air pressure will work except when the burner is required to turn down to very low outputs. At low outputs, reduction in air pressure is desirable because the flame becomes unstable if too much atomizing air is used. For an oil consumption of 1½ lb per hr at a pressure of 5 psi the quantity of atomizing air passed is 8 pct of the air for combustion. At a pressure of 3 psi it is about 5½ pct. At oil consumption rates from 5 to 10 lb per hr, experience shows that good atomization is obtained with as little as 1 pct of the air for combustion, or 2½ cu ft per lb of oil.

Four of these Y burners were installed in a standard commercial gas fired semi-muffle, general purpose furnace. The working chamber is 2 ft wide x 3 ft long x 1 ft tall. The method of applying the burner to the combustion chamber and admitting the secondary air is shown in Fig. 3. The combustion chambers to which the gas burners were applied were 3 in. high, 4½ in. wide and about 1 ft long. There were two on each side of the furnace. These led directly into ducts under the hearth. The burners were capable of being operated down to outputs as low as 0.4 lb per burner per hr. Actual test results are given in accompanying table. The times quoted for heating up are those for raising an empty furnace from cold to working temperature.

During the war enemy bombing often interrupted the city gas supply and made it necessary for ordnance and aircraft factories to be supplied with a stand-by means of heating furnaces. For this reason the Y burner was manufactured in large quantities and distributed to these factories for emergency use. The exact details of the prototype burner and the Ministry of Aircraft Production's mass producer burner differ slightly. The length of parallel of the final orifice of the prototype, an important factor, was 0.01 in. The increase in the number of grooves and a certain latitude in the length of

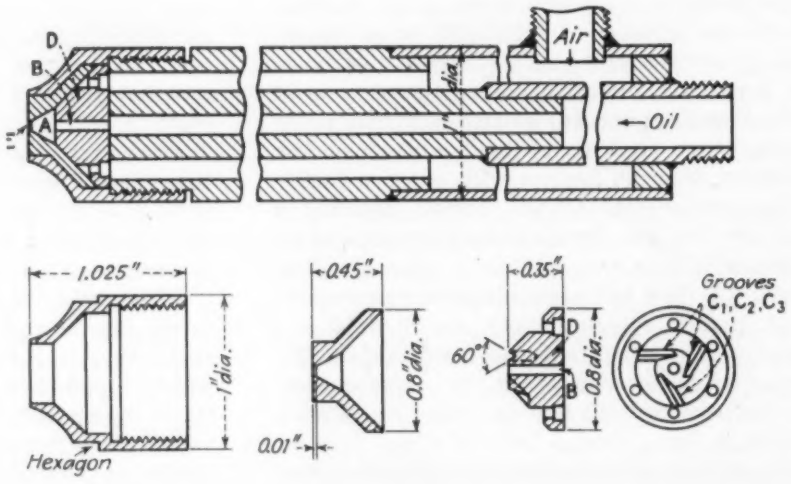
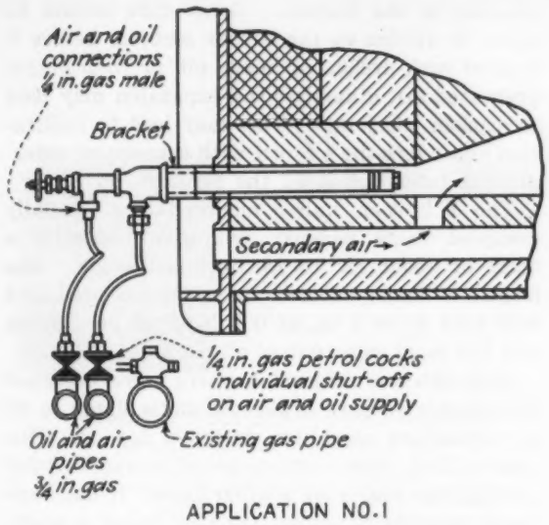
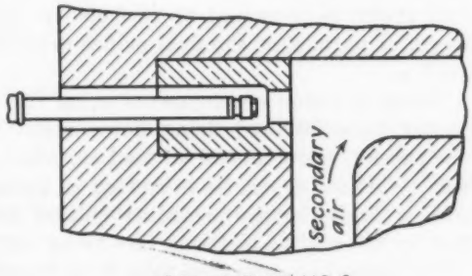


FIG. 2—The Y type burner design introduces oil through opening B and air through tangential grooves C1, C2, C3. The air and oil are mixed in swirl chamber A, and discharged through orifice E.


Air and oil connections ¼ in. gas male
Bracket
Secondary air
¼ in. gas petrol cocks individual shut-off on air and oil supply
Oil and air pipes ¾ in. gas
Existing gas pipe

APPLICATION NO.1



APPLICATION NO.2

FIG. 3—Applications 1 and 2 illustrate typical Y burner installations in combustion chambers of standard gas fired furnaces.

the final orifice in the mass produced articles does not constitute an improvement. For normal industrial use the original prototype design is to be preferred.

Many new industrial applications have been found for this small capacity multi-burner furnace. These can be divided into two types. First, those that draw air in around the burner by either chimney pull or by induced draft fan. The second type is that in which air is introduced through a specially designed casing by forced draft fan. Several of each of these types have been designed for special applications.

In a forced draft application, a casing was developed for a furnace in which there was no available chimney pull. The following conditions were achieved: (1) Air for combustion was introduced in such a manner that the flame did not become unstable, leave the burner nose, or become extinguished, (2) The flame angle produced by the Y type burner was widened so that a shorter and more busy flame completed itself in the 12x12x12 in. combustion space.

Twelve of these combustion chambers were mounted on a bell used for annealing steel sheets. The oil consumption range of each burner was from 2 to 9 lb per hr. The air entering the forced draft front is given a rotational velocity. It then passes into the furnace through an opening in the same diaphragm through which the burner is inserted. The amount of rotation, the position of the burner nose relative to the diaphragm, and the size of the hole in the diaphragm are all critical if stable combustion conditions are to be obtained.

A second forced draft application was designed for an oil fired, hot water boiler to provide heating for a road or rail vehicle. The oil burning installation had to work completely without human supervision and to be independent of any chimney pull. Combustion was not to be impaired by accidental down-draft. The burner was applied through a forced draft casing arrangement. Ignition of the burner was achieved by two high voltage electrodes. The operation of the ignition transformer, combustion air fan, atomizing air compressor, and oil pump were all controlled by a hot water thermostat so that the burner operated intermittently to maintain the desired water temperature.

A third application of the forced draft type was designed to heat a small ceramic tunnel kiln on both sides by a series of oil fired combustion chambers. Combustion air was supplied at a temperature at 300°C and a pressure of about 1.0 in. WG at the inlet to the casing. The atomizing air was supplied cold at a pressure of 5 psi. It was imperative that combustion should be completed within 15 in. so as to avoid flame impingement on the saggars containing the goods. Due to the entry velocity of the preheated air, it was necessary to develop a reliable means of stabilizing the flame. A prototype combustion chamber was built and operated very successfully in the oil consumption range of 2½ lb to 5½ lb per hr.

In another pottery kiln application, 40 Y-type burners were distributed around the furnace. Secondary air was supplied to the burners through forced draft casings. Trials were made using various grades of oil. No difficulties were encountered when using air at 300°C, and oil having a viscosity of 993 sec, Redwood 1, at 100°F. This grade of oil was preheated to a temperature of 178°F. The combustion chamber temperature was about 1200°C.

A detailed examination of the burner when operating as above showed that the temperature of the nose of the burner was unlikely to exceed 685°F. These temperature conditions did not cause any trouble in the firing of the burner.

BURNER HEATING CHARACTERISTICS

Working temperature	600° C	800° C	1000° C
Time to heat to working temperature	35 min.	60 min.	114 min.
Maximum consumption rate (4 burners)	19 lb/hr	19.5 lb/hr	16.75 lb/hr
Consumption to maintain working temperature per burner	0.7 lb/hr	1.25 lb/hr	2.0 lb/hr

Continued

When operating under severe conditions it is highly desirable that the air compressor supplying the atomizing air be fitted with a reliable oil separator to eliminate the deposits that occasionally occur in the air passages of the burner. These are apparently caused by the carbonizing of the lubricating oil carried over by the air.

Occasionally a nozzle may tend to develop a small corona of carbon around the orifice. This does not interfere with the correct operation of the burner. It has been noticed that after some hours operation at high temperature the coronas disappear.

As the maximum pressure required for atomization is 10 psi, the conventional bladed type compressor can be employed. The quantity of air required is very small, being of the order of 2½ cu ft per lb oil. The atomizing air line to each burner can, therefore, be as small as ¼-in. bore. To reduce the atomizing air pressure when turning the burner down to the lower part of its range, a control valve of the ordinary gate type should be provided.

When using a heavy grade of industrial fuel in this burner there must be no severe temperature drop on the way to the burner nose. This can be insured by keeping the circulating hot oil as near as possible to the burner. The burner as assembled depends upon a screwed cap at the nozzle end for maintaining an oil-tight barrier between the atomizing air channel and the oil passage in the burner. Great care should be taken to tighten up the burner securely before it is used with preheated heavy oil, or with highly preheated air, otherwise the expansion may tend to slacken the joints. This may lead to infiltration of air into the oil duct with consequent intermittent interruption of the flame.

The Y burner, unless mounted in a specially designed flame widener, will give naturally a flame of about 12° to 15° included angle. The length of flame depends upon the oil used and may vary from 3 in. at 0.5 lb of oil per hr, up to 3 ft 6 in. at say, 10 lb of oil per hr.

Although the original burners were designed deliberately to give a narrow angle flame to fit in combustion chambers designed for use with gaseous fuel, these burners are often supplied for installations requiring a wider flame. It has been found possible to achieve this by using a modified final orifice plate in which the diameter of the final orifice is increased up to 0.090 in. and the length of parallel at the final orifice decreased to 0.005 in.

The most recent developments using this small burner have involved firing down metal tubes. The tubes themselves can be used as radiators to heat a furnace or can be immersed in tanks containing fluids thereby providing quicker heating than by alternative methods. By firing with this burner down a perforated tube it is possible to reproduce from quite lenthy tubes the effect of a row of gas jets. By this means many types of low temperature furnaces, such as those required for baking bread, cooking foods and stoving enamels can be fired in place of the former methods employing city gas burners.

NEW BOOKS

"How to Take a Case Before the NLRB," by Louis G. Silverberg. Written by the Director of Information of the labor board, the book tells what to do in representation cases, in union shop cases, before and during plant elections, and in charges of unfair labor practices brought by management or the union. Included is a section showing sample forms on how to petition, complain, and appeal, and what kind of documentary evidence to attach. The Bureau of National Affairs, 1231 24 St. N.W., Washington 7, D. C. $5.00.

* * *

"1949 Metal Finishing." Eighteenth annual edition of this guidebook-directory contains sections on finishing plant engineering, abrasive methods, cleaning, pickling, electropolishing, plating solutions, surface treatments, and other finishing operations. An equipment and supply directory and a trade names supplement are also included. Finishing Publications, Inc., 11 W. 42nd St., New York 18. $2.00. 468 p.

"The Supervisor's Management Guide." The third in a series published by AMA, this desk manual was prepared by 17 operating executives and specialists to assist supervisors, foremen and other operating executives in industry to apply new developments in management methods for improving human relations in business. American Management Assn., 330 W. 42nd St., New York 18. Price to AMA members, $3.00; nonmembers, $3.50. 190 p.

* * *

"The Corrosion of Mild Steel by the Products of Combustion of Gaseous Fuels." A domestic research report recently completed for the American Gas Assn. by Battelle Memorial Institute, summarizing a study of factors influencing corrosion behavior of mild steel in the presence of combustion products of fuel gases under simulated operating conditions. American Gas Assn., 420 Lexington Ave., New York 17. $0.75. 50 p.

New Galvanizing Furnace Forms No Dross

By MARIO TAMA, Chief Research Engineer,
Ajax Engineering Co., Trenton, N. J.

This induction heated, refractory lined furnace eliminates galvanizer's dross formed by reaction of the container with the molten zinc bath. Because of close temperature control, absence of fumes, plus better and cheaper coating this unit is a major contribution to the hot dip industry.

SINCE galvanizing was invented in the early part of the nineteenth century, the zinc bath has been contained in a steel kettle heated externally by coke, oil, gas, or electric resistance. One of the fundamental limitations of this process has been that the container is subject to gradual dissolution by the molten zinc. Not only is the container expendable but it also results in additional waste in the form of galzanizer's dross.

Galvanizer's dross is essentially an alloy of zinc containing about 4 pct iron, which settles at the bottom of the bath as more and more iron is dissolved from the workpieces and from the kettle. It is the practice to remove the dross from the kettle at regular intervals. The zinc content of galzanizer's dross is recovered by a distillation process. As this procedure entails one of the important steps of the reduction of zinc from ore, it is quite costly. Thus, the dross loss is one of the major cost items in galvanizing.

Today 45 pct of the entire zinc production in the United States, or about 359,000 tons of zinc (1948 statistics), is used for galvanizing every year and about 51,000 tons of galvanizer's dross are generated annually.

In distilling operations care is taken not to permit iron to come in contact with the spelter. Despite this the first thing the galvanizers do is melt the spelter in a steel kettle which contaminates the zinc and starts to form dross. Not all the dross formed comes from the zinc reaction with the kettle.

Imhoff[1] studied the rate of solution of iron in a zinc bath by immersing 6 sq. in. of steel sheet for a period of 6 hr at different temperatures.

The amounts of iron dissolved in the bath after this procedure are shown in the graph, Fig. 1.[1] It will be noted that the rate of dissolution increases rapidly in the range from 850° to 950°F. Most galvanizing operations are carried out between 840° and 860°F.

Fig. 2 shows the amount of iron dissolved in a bath of molten zinc at various temperatures as a function of time, as investigated by Daniels.[2] It will be observed that the attack, below 900°F, does not progress at a linear rate, but tapers off as time progresses, because formation of an inter-alloy layer has a retarding effect on the alloying rate. According to Daniels, dissolving of iron at low temperatures

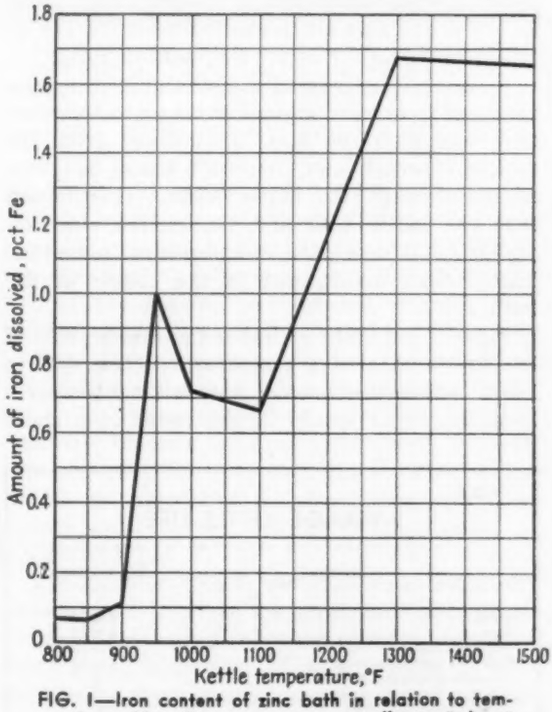
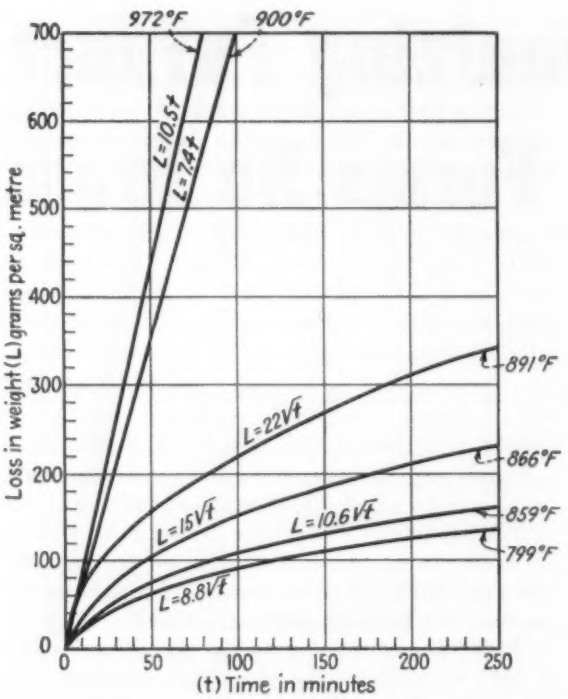


FIG. 1—Iron content of zinc bath in relation to temperature. Hot dip processes are usually carried out below 900°F. Any over-heating of the kettle, however, rapidly dissolves iron and builds up dross formation.



FIB. 2—The amount of iron dissolved at low temperatures as affected by time at temperature. Iron contamination of the zinc bath increases with the square root of time.

increases with the square root of time. However, it never stops, not even at the lowest temperatures at which zinc is molten. Zinc melts at 787°F and Daniels' lowest curve is for 799°F, which is only 12°F above the melting point.

In present galvanizing techniques the heat required to bring the steel parts up to temperature and melt the zinc is obtained from the molten reservoir and, therefore, has to be transmitted through the kettle walls. This means that the kettle wall and the molten zinc adjacent to it are at a temperature somewhat higher than maintained in the center of the bath.

Figs. 1 and 2 show that if the inside wall of the kettle attains a temperature from 50° to 100°F above the normal galvanizing temperature, the kettle would be destroyed in a short

TABLE I

AVERAGE KETTLE LIFE

Industry	Life in Months
Sheet	8 to 4
Pipe	6 to 12
Structural Steel	12 to 18
Pole Line Hardware, Large	9 to 12
Pole Line Hardware, Medium	9
Pole Line Hardware, Small	6
Range Boilers and Tanks	18
Wire	10 to 12
Metal Ware	24
Castings	9 to 12

TABLE II

CAUSES OF DROSS FORMATION

Source	Pct Formed
Iron Salts	50
Overfiring	25
From Work to be Coated	15
Iron Container	10

Courtesy W. H. Spowers

period of time. Each pound of iron dissolved produces 25 lb of galvanizer's dross.

Imhoff lists the average kettle life, as observed in the different galvanizing industries, in Table I. The fact that the kettle is made of a material that readily alloys with molten zinc has always imposed considerable limitations on most galvanizing operations. Since no other type of container appeared practical, these limitations have with time come to be regarded as basic difficulties of the process. Many improvements have been made in the design of galvanizing furnaces. One notable method is to fire the upper area of the side walls only, with no heat applied to the lower regions of the kettle. Another is to supply substantially uniform heat

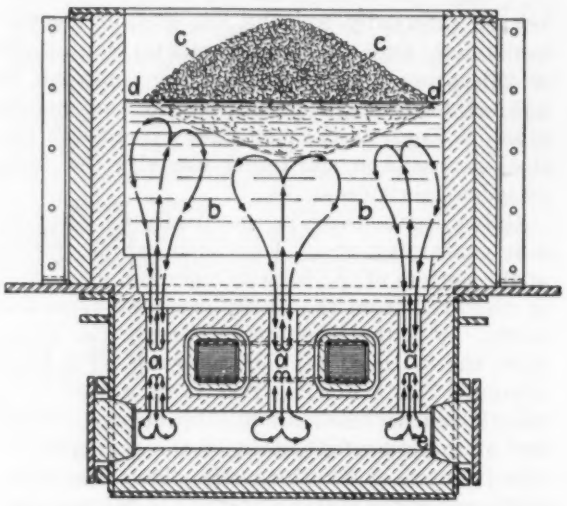


FIG. 3—Diagram of a twin-coil low frequency induction furnace: (a) secondary melting channels, (b) hearth.

input over the firing area by means of gas-fired radiant tubes or electric resistance units.

It is not practical to apply heat through a layer of dross and so avoid local overheating to a large extent. These recent improvements have resulted in longer kettle life and reduced formation of galvanizer's dross. They have not eliminated, however, the basic drawbacks of the use of the iron kettle.

Many additional tons of galvanizer's dross are still formed as each kettle wears out. However, the rate of heat input into a given size molten zinc bath is definitely limited if frequent breakdowns are to be avoided. If it was not for this factor, much greater production per unit could be obtained in many operations.

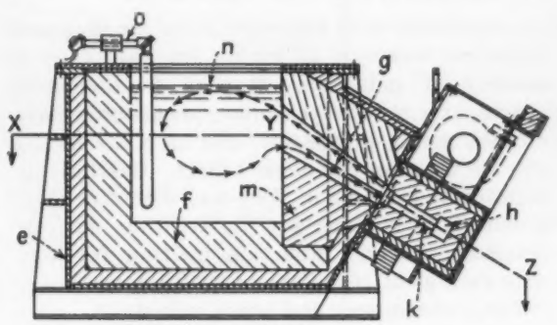
It was realized long ago that it would be desirable to hold the molten zinc in a container that would be inert to it. Most common refractory materials are not attacked by molten zinc at temperatures up to 1000°F, but no practical method was known for applying the heat. The crucible type furnace is rather limited in size, considering that containers holding from 5 to 250 tons of molten zinc are required. A reverberatory type furnace would be impractical, as the intense heat above the surface of the melt would interfere with manual or mechanical dipping.

Until recently, there was no way of using a refractory container for the galvanizing bath. The use of a low frequency electric induction melting unit for galvanizing provides an entirely new approach. Recent developments point the way to large and powerful induction galvanizing furnaces, with refractory containers of essentially unlimited life, which do not in any way contribute to the formation of galvanizer's dross.

The low frequency Ajax induction furnace became established as a melting unit in the brass industry in about 1918, and has recently found increasing use in the fields of melting aluminum, zinc and their alloys. A low frequency induction melting furnace of modern design, such as is used today in the melting of pure zinc and zinc diecasting alloys, is shown in Fig. 3.[3] Operating essentially as an electric transformer, power is induced from a primary coil in the secondary channels (a) attached to the bottom of a hearth (b). All the heat generated in the molten metal in the channels is conveyed immediately to the hearth area by the intense molten metal circulation produced by electro-magnetic pressures. As a result, the temperature of the entire molten metal mass in the hearth is completely uniform at all times, even if much more power is applied than possible with an externally fired container of the same size.

This established principle of low frequency induction melting was recently applied to galvanizing in a modified form, shown in Fig. 4. The zinc container, or hearth, has a rectangular shape. It consists of a steel housing (e) provided with a refractory lining (f). An inclined opening, or passage (g), is provided in the side wall and flares out into the upper portion of the hearth. A twin-coil inductor unit (h), of standard design, is attached to the side wall in such a manner that the inclination of the melting channels (k) is in alignment with the wall opening, or passage (g), and the metal flow only reaches the upper portion of the bath (see arrows). The refractory lining of the hearth has an extension (m) for attachment of the inductor unit which is of the same design as shown in Fig. 3.

The metal, which is constantly heated in the induction unit, enters the upper zone of the bath beneath level (n); the bottom section, therefore, remains undisturbed. Contamination of the metal with dross in the upper region of the bath is eliminated; the settling of dross and other impurities in the bottom of the bath is undisturbed.



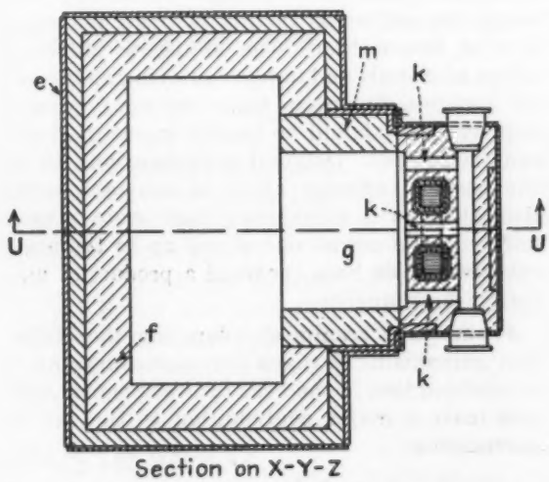


FIG. 4—Sections of a low frequency induction furnace for galvanizing purposes. Heat is generated in the inductor unit and conveyed to the hearth by electromagnetic forces, as shown by the arrows. Note the position of the inductor and channels in the upper half of the furnace wall to comply with the principle that the bottom of the hearth must not be heated so as to allow for the settling of dross.

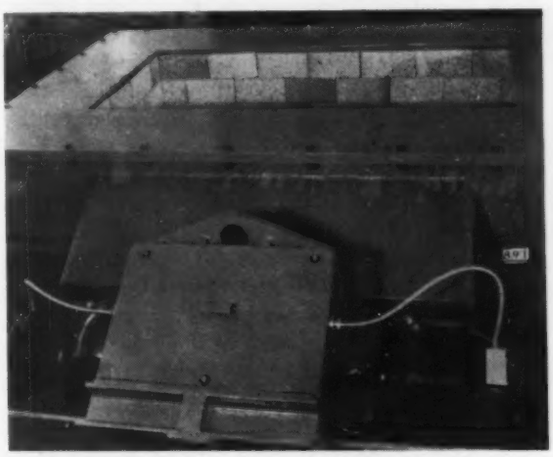


FIG. 5—This low frequency induction furnace is powered with one 100 kw inductor and will produce as much as the old 10-ton iron kettle unit. Hearth of the furnace consists of 9-in. thick refractory side and bottom. The inductor unit has a monolithic lining tightly rammed with Ajax 108 refractory mixture.

The furnace is provided with a recording thermocouple (o) in the working zone and with automatic controls to maintain temperature. The center planes of the vertical channel extend towards the open top of the furnace so that the melt-channels of the induction unit can easily be reached and cleaned with cleaning tools. Fig. 5 shows the 7-ton galvanizing furnace, built by Ajax Engineering Corp., and recently installed at a prominent steel company. The induction power unit is attached to the side of the stationary hearth, to comply with the principle that heat should not be applied to the bottom. This arrangement allows the galvanizer's dross formed by contact of molten zinc with the steel objects and iron salts to settle out of the tank.

In addition to eliminating the difficulties and costs resulting from the use of an iron kettle, the low frequency induction principle brings to the galvanizing process a degree of precision of temperature control heretofore unattainable. This is made possible by the internal circulation and the avoidance of all time lags characteristic of external heating. Better temperature control results in more uniform quality of the product.

Precise temperature control also eliminates the formation of additional quantities of dross from the workpieces caused by periods of unnecessary overheating and local areas of excess temperature practically unavoidable in externally fired kettles. According to Table II the use of the induction galvanizing furnace would eliminate 35 pct of the total dross formed, and in more modern operations where effect of the iron salts has been minimized, the percentage saved may be even greater.

The losses shown in Table III will vary widely with the nature of the application. The contribution made by the iron kettle and the effect of poor temperature control will represent different proportions in each industry. Most galvanizers will agree, however, that at least 10 pct can be gained by elimination of the iron kettle and at least another 10 pct by perfect temperature control. As many installations use thousands of tons of zinc per year, the savings that can be effected by the use of the induction furnace represent substantial amounts.

TABLE III

DROSS LOSSES IN DIFFERENT GALVANIZING OPERATIONS*

Industry	Lost as Galvanizer's Dross, Pct	Total Loss Including Surface Skimmings, Pct
Malleable Iron and Fittings	46.7	61.4
Pole Line Hardware	34.6	59.6
Jobs and Miscellaneous	27.8	47.0
Structural Steel Galvanizing	22.0	41.5
Wire Galvanizing	21.3	40.5
Pipe Galvanizing	18.9	31.1
Wire Cloth	13.5	36.9
Boilers and Tanks	13.5	26.5
Sheets	10.0	22.8
Metal Ware	8.5	19.7

* Losses are in pct of total amount of Zn lost.

Courtesy W. G. Imhoff.

The electric induction furnace has an overall efficiency of 70 to 80 pct. Therefore, the electric power consumption is of the order of 100 kw-hr per ton of steel galvanized. This compares favorably with the cost of fuel in most locations.

The 7-ton furnace, shown here, is powered with one 100 kw inductor to attain the same production rate as similar iron kettle units of slightly larger size (10 tons). It has a maximum production rate of 1 ton per hr of galvanized steel. However, it is entirely practical to apply two or three times as much power to the same 7-ton induction furnace. The production from the same unit could be doubled, or tripled, if mechanical and other considerations permit. The furnace and kettle are no longer a limit to the production rate.

Several Advantages Cited

Larger and more powerful units are obtained by using inductors of higher kw rating, or a number of inductors attached to the same hearth, or both. Electric inductors are now made up to a rating of 333 kw, and as many as six may be used on the same hearth. Galvanizing units up to a rating of 2000 kw, with a production rate of 20 tons per hr, are thus entirely feasible. Electric induction melting furnaces with ratings of 1000 kw and 2000 kw, are in use today in the copper and brass industries.

Comfortable working temperatures, absence of exhaust gases and fumes, and the general cleanliness possible with induction melting furnaces, are additional factors favoring the adoption of this method. The ability to maintain alloys uniformly and to make alloying additions, for instance, aluminum, tin or antimony, quickly and precisely should be helpful in certain modern techniques. Original apprehensions as to the possible adverse effect of constant metal circulation in a galvanizing bath were proven unfounded in actual operations up to the present time, which have rendered a product of uniformly high quality.

Preliminary results of operating the induction galvanizing furnace are so encouraging it is expected that in the near future this principle will make a major contribution to the art of galvanizing.

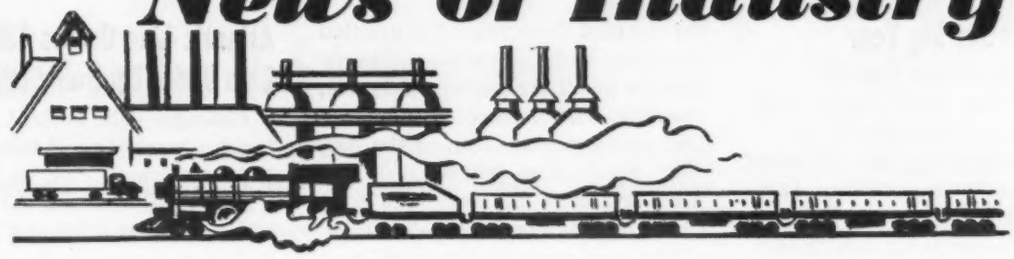
References

[1] "Destruction of Galvanizing Pots," by W. G. Imhoff, THE IRON AGE, Jan. 23, p. 294; Feb. 27, p. 633; Mar. 27, p. 933, 1930. "Galvanizing Pot Life," by W. G. Imhoff, THE IRON AGE, Apr. 7, 1930, p. 1154.

[2] E. J. Daniels, Journal Institute of Metals, vol. 46, 1931, p. 81.

[3] M. Tama, "Melting Scrap in the Low Frequency Induction Furnace," THE IRON AGE, Sept. 4, 1947, p. 76.

News of Industry



Steel Earnings

Pittsburgh — Listed in brief are items from THE IRON AGE financial analysis of 1949 covering 26 steel companies with 92 pct of the industry's ingot capacity, showing the change from 1948. The complete report is on page 106.

Net earnings	off 2.3 pct
Net sales, operating revenue	off 9.2 pct
Federal income tax provision	off 2.2 pct
Steel shipments	off 11 pct
Common dividends declared	up 10.3 pct
Surplus	up 13.1 pct
Invested capital	up +7.0 pct
Capital per ton of ingot capacity	up 4.9 pct

Opens Philadelphia Mill Depot

Philadelphia—A new mill depot to serve Maryland, Delaware, Virginia, and Washington, D. C., customers was opened last week here by the Wolverine Tube Div. of the Calumet & Hecla Consolidated Copper Co., Detroit.

Offices will be at the Liberty Trust Bldg., Broad and Arch Sts. J. H. Smith, Wolverine Philadelphia Sales representative, will be in charge.

Buys Albany Car Wheel Co.

Buffalo — The New York Car Wheel Company, Buffalo, has purchased the Albany Car Wheel Company in Menands, N. Y., from the National Iron Corporation of Toronto.

Automakers See 7 Million Car Year—Maybe

Model cutbacks, inventory adjustments not figured in optimistic estimate . . . Some potential market has been used up . . . Market will at least equal last year—*By W. G. PATTON*

Detroit — If you listen real closely in Detroit these days you can hear faint murmurings about a 7 million car year. This estimate is arrived at by taking first quarter production, adding a bigger chunk for the second quarter (to include Chrysler plus a bump in output for GM, Ford and a few independents) and multiplying by a factor of two. This is undoubtedly an estimate tinged with optimism but it is a figure some of the experts like to toy with.

It should be recognized that this estimate fails to include (1) model cutbacks—and there will be some by each of the big three, (2) possible curtailment of some segments of the economy, including appliances, building, etc., or (3) inventory adjustments by either car producers or their dealers.

More Sobering Factors

Realistic appraisal of the situation seems to demand that the following factors be recognized: (1) Some of the potential market for cars has been used up. Very old cars have been replaced and the new group of buyers that came into the market as a result of population increase has been at least partially satisfied; (2) most dealers are losing money on used cars; (3) many car sales are being made by paring the dealer's commission.

There is no reason to believe the car market will be worse in 1950 than it was in 1949. It will probably be better—but not nearly a million cars better.

High pressure steel conditions are continuing here as usual. Reports from the trade indicate there are about as many conversion participants as there were last year. However, the race is not as swift and it is not as hectic. Scrap prices are strong but so far they aren't jumping wildly over the

Turn to Page 100

Engineering Company Formed

Birmingham — Patterson-Emerson-Comstock of Alabama, Inc., an industrial engineering and construction company, has been organized here. It is affiliated with Patterson-Emerson-Comstock, Inc., of Pittsburgh. The new offices are in the Brown-Marx Building.

Phoenix Signs with Union

Phoenixville, Pa.—A new two-year agreement has been signed by the Phoenix Iron & Steel Co. and Local 2322, United Steelworkers of America, CIO.

The pact, according to management, is effective as of Feb. 28, 1950 and will expire Feb. 28, 1952.

Automakers See Big Year

Continued from Page 99

fence. GM and Ford are on new high production ground.

Past reluctance to take on third quarter conversion is melting fast. For every steel buyer not willing to risk third quarter commitments there is another who will sign on the dotted line. Conversion seems definitely with us in the third quarter and probably in sizable volume.

Don't look for any cuts in auto output for a month or two. Several companies have reported that dealer stocks are now substantially lower than the January figure. The industry is rarin' to go—it doesn't know how far it is going but it's sure on its way and has no intention of looking back.

Resume Your Reading on Page 99

Buys Harvey Co. Building

Racine, Wis. — The Massey-Harris Co. has purchased the farm tool division buildings of the Harvey Mfg. Co., which recently sold its farm equipment business. The buildings contain 78,000 sq. ft. of factory space adjoining the Massey-Harris plant in Racine, and will be used as new forging and sheet metal facilities for production of Massey-Harris farm machinery.

Lake Ore Flow Frozen

Chicago—Ice 19 in. thick in harbor channels of Duluth-Superior and 28 in. thick in the slips threatens to delay the opening of the iron ore upper lakes movement until May 1. The grip of winter on the waters has not relaxed despite ice breaking maneuvers of the Coast Guard.

At this time in 1949 the fleet had been hauling ore for more than two weeks. The Ice Committee of the Lake Carriers' Assn. will meet on Apr. 13 to study ice conditions and weather reports.

Army Profits from Metal Sales

New York—The Army is profiting from the preparation and sale of scrap, ferrous and non-ferrous, as well as secondary metals. Congress for the past three years has granted the Army sufficient money to carry out the demilitarization of surplus, obsolete, and hazardous ammunition and material. During the current fiscal year $22,500,000 was made available and for fiscal 1951 the Army has asked for $15 million.

The cash profit in fiscal 1949 was $400,000. More important, however, strategic nonferrous materials valued at $4.2 million were added to the defense stockpile.

Navy Contracts Awarded

Washington — The Navy Dept. will buy $72,695 worth of special forgings from the Midvale Co., of Philadelphia, under a contract signed recently.

Other recent contracts include one to the Sperry Corp. for eight automatic pilots amounting to $81,256 and another for 10,000 ¼ ton Mark 65 Mod. O practise bombs to Lynch Bros., Inc., Pine Meadow, Conn., amounting to $122,400.

Ladish Signs Bonus Contract

Milwaukee — A labor contract assuring a 1950-51 workers bonus payment has been signed by the Ladish Co., producers of drop forgings and seamless pipe fittings. Length of service will determine bonuses to fall within 2-4 pct of annual earnings, exclusive of overtime and vacation pay.

"You can always tell when its payday"

Atlantic Line Orders 1300 Cars Under Equitable Lease Plan

Chicago—The freight car building for lease plan of the Equitable Life Assurance Soc. is gathering a good head of steam for its excursion into the railroad business. Pullman Standard Co. is gearing its shops for the production of 1300 cars to the Atlantic Coast Line Railroad and possibly another 1500 for the New York Central if negotiations crystallize.

Glitters to Pinched Roads

As has been foreseen in a previous article (THE IRON AGE, Apr. 6, 1950, p. 113) the Society's project would have a special glitter to roads interested in conserving cash. Both Atlantic Coast and New York Central have heavy bond maturities coming up in the next few years and the no-down-payment feature of the 15-year lease plan was of prime importance

Leasing agreement details were not revealed but unofficial reports further a previous report that per diem rental per car would be less than the standard fee roads pay each other—$1.15 per car for the first year, less later. Equitable will pay 80 pct of car costs to Pullman on delivery and the balance in five annual installments.

Plant Dispersal Denied

Los Angeles—Current question asked almost all leaders of the government in regard to the aircraft industry is: "Will plants here be dispersed?"

Latest to deny that the plants will be moved inland was Brig. Gen. Thomas H. Chapman, U. S. Air Force senior officer, who termed rumors of the move as "misinformation."

"The policy of the Air Force is to stimulate and augment West Coast production, not discourage it," he said.

Gen. Chapman said that the Air Force's program calls for a steady increase of contracts for military aircraft.

Mechanical Loaders Work in Metal Mines

Need to cut costs, hike output shifts machines that revolutionized coal mining to metal, limestone shafts . . . Machines in use pass tests . . . France buys Joy Co. equipment.

Pittsburgh — Prodded by the need for increased production and reduced costs, operators of underground metal and limestone mines are turning to mechanical loading and handling equipment.

Facilities that revolutionized the coal industry, redesigned to meet more severe operating conditions, are well along the road toward doing a similar job in underground iron ore, limestone, lead and zinc mines.

Mechanical loaders have been in use for some time in underground limestone and iron ore mines, and are passing tests in very hard rock lead and zinc mines. The word has spread to Europe, too. France recently ordered $1 million worth of equipment from the Joy Manufacturing Co., Pittsburgh, to mechanize its iron ore mines.

Joy Co., for years a manufacturer of coal mine equipment, found itself in this new field when a Western Pennsylvania limestone producer, confronted with an operating problem, asked for assistance. The limestone operator was extending his operations to expand production of 7000 tons per day when he encountered roof conditions too low for the conventional power shovel. He asked Joy to experiment with its continuous coal loader in his mine.

Joy engineers equipped an 11-BU Joy loader with armor plate and heat-treated parts for the more abrasive conditions of limestone handling. They modified a pair of company trackless coal shuttle cars. The team worked so well that the engineers reasoned a machine designed for the purpose should produce at least 700 tons in an 8-hr shift.

With this experience, Joy engineers developed the first design series of hard rock mechanical loaders, the 18-HR-1. One limestone producer is now using a group of ten machines to handle his complete production. A later model, the 18-HR-2, is working well in iron ore and other deep metal mines.

The 18-HR-2 uses manganese for the arms, abrasion resisting plates for the conveyers, and tool steel for the snout and loading head. It is 27 ft long and 6 ft 10 in. wide. A narrower version, 5 ft 5 in. wide, to meet operating conditions too restricted for the more amply-proportioned 18-HR-2 is being built.

The construction industry has shown interest in the mechanical loader for use in high speed tunnel driving, and studies are underway to adapt the equipment to this field.

GETTING THE LEAD OUT: In a Midwest lead-zinc mine a Joy Co. hard rock loader and a shuttle car team gives lead a quick trip to the surface. Scenes like this are becoming commonplace in metal and limestone mines which are taking the same steps coal mining did to raise the tempo of production cheaply.

ASA Approves Two New, Two Revised Machine Tool Standards

New York—Two new and two revised American Standards for machine tools covering punch and die sets for two-post, punch press tools, involute serrations, single-point tools and tool posts, and straight and taper shank twist drills have been approved by the American Standards Assn.

They are part of a series of American Standards for small tools and machine tool elements developed by an ASA technical committee sponsored by the American Soc. of Mechanical Engineers; Soc. of Automotive Engineers; National Machine Tool Builders' Assn.; and the Metal Cutting Tool Institute.

The new standard for punch and die sets for two-post, punch press tools covers the design and dimensions of back-post and diagonal-post sets. The involute serrations standard replaces the SAE serrated shaft standard, providing a uniform, easily fabricated set of serrations for greater selection of sizes of teeth diam.

The single-point tools and tool posts standard contains three sections on standard types of single-point tools, in addition to standard terminology, definitions, and tool and tool holder sizes of earlier standards. The revised straight and taper shank twist drills standard has four major changes from the 1940 edition to provide interchangeability of products of different manufacturers.

First Pipe Leaves

Twin mills of U. S. Steel's subsidiaries can make 1200 miles of 30-in. electric weld pipe a year. First shipments leave.

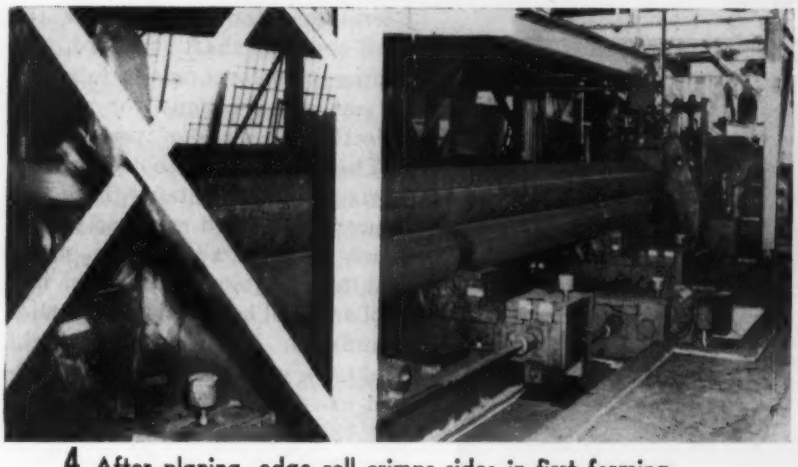
New York—Linepipe is one of the very tight items in the steel market today. It has been sold out by some companies well into 1951. But some relief is on the way. Last week U. S. Steel disclosed that its new twin, electric weld, pipe mills at Orange, Tex. (Consolidated Western Steel Corp.) and McKeesport, Pa. (National Tube Co.) had begun turning out their first linepipe.

When the mills reach full production in about 2 months, each will be making large diameter linepipe at a rate of 100,000 tons a year. Together, they are

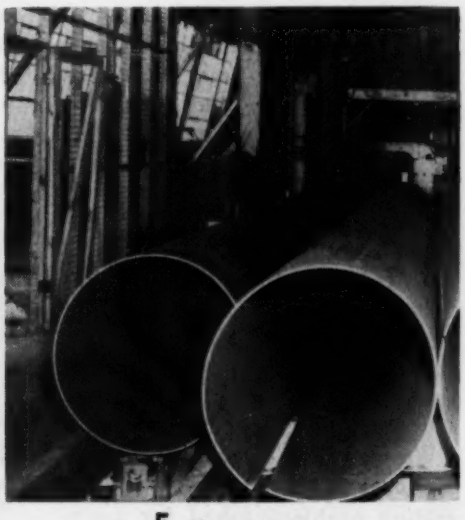
1 Shear first slices plate to proper length for pipe.

2 Cut to length, plate then goes to first edge planer.

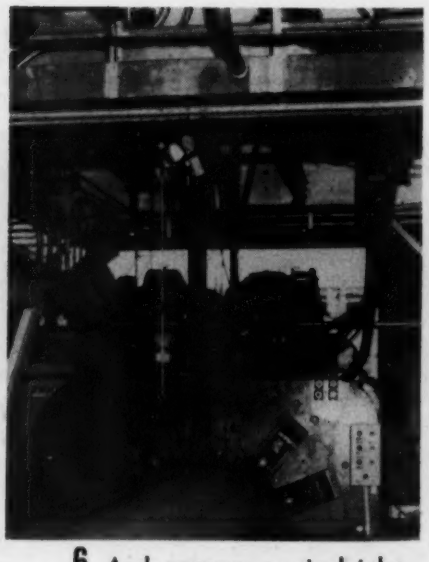
3 First edge planed, plate goes to dryer, second planer.



4 After planing, edge roll crimps sides in first forming.



5 Shaped plate enters outside



6 And emerges as steel tube.

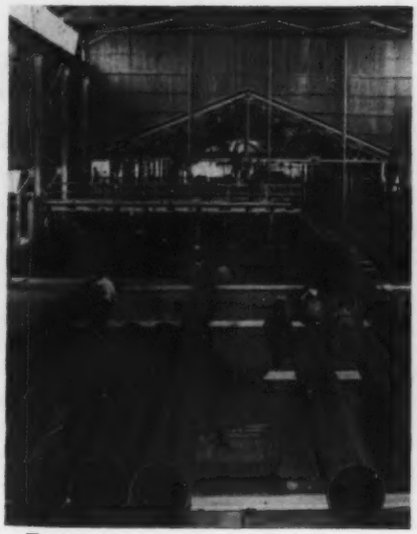
New Twin Mills

capable of turning out 1200 miles of 30-in. pipe a year.

In their initial operations, both are working on an order for 30-in. diam pipe consigned for the Tennessee Gas Transmission Co. However, both mills can make pipe up to 36-in. in diam. Both utilize high speed assembly line production which carries steel plate from storage yard to shipping yard as finished pipe. Equipment in the two mills is very similar but not identical. The accompanying photos were taken in the Texas mill.

An interesting feature of this mill is that the pipe storage area is accessible by rail, truck, barge, or ship. The 900 ft long building is converted from facilities of the wartime naval shipyard purchased from the government last year.

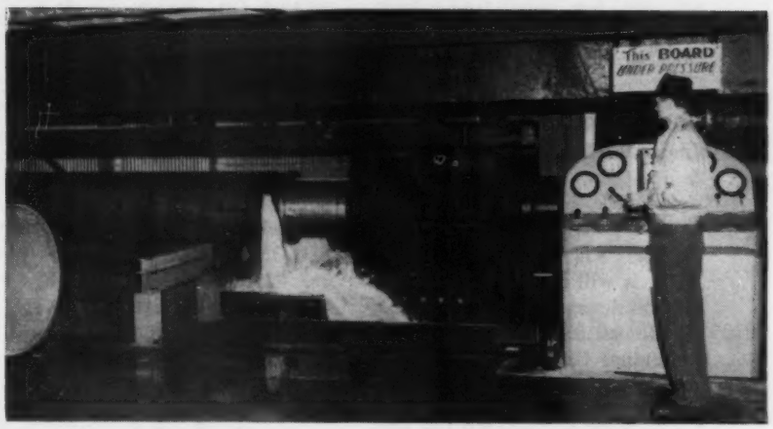
electric welding machine.



7 Pipe gets inside welding.

8 Closeup shows synchronized inside welding operation.

9 Hydraulic expander adjusts diameter—a key operation.



10 Expander releases pipe and hydraulic fluid gushes out.

11 After drying, pipe ends are beveled on facing machines.

INDUSTRIAL SHORTS

MARFORM GOES ABROAD—By arrangement with the Glenn L. Martin Co., Baltimore, the LOEWY ENGINEERING CO., LTD., London, England, will introduce the Marform Process into Europe and other export territories. Complete presses as well as equipment for incorporation into existing presses to carry out the Marform metal forming process will be supplied by Loewy Engineering.

ENROLL NOW—A Sand Shop Course is being sponsored by the Metropolitan Chapter of the AMERICAN FOUNDRYMEN'S SOCIETY at the Stevens Institute of Technology, Hoboken, N. J. It will be held from Apr. 20 to 22 with Frank Brewster of the Harry W. Dietert Co. as instructor.

JOIST PLANT STARTS—Production has started at a new $125,000 bar joist fabricating plant of the VIRGINIA STEEL CO., Birmingham.

CONSULTANTS MEET — A dinner meeting will be held Apr. 25 at the Shelburne Hotel, New York, by the ASSN. OF CONSULTING CHEMISTS & CHEMICAL ENGINEERS, INC. It will be a symposium on "Professional Chemical Services by Consulting Associates and Individual Consultants."

CYLINDER AGENT—The Hydro-Line Mfg. Co., Rockford, Ill., has appointed the MINE & SMELTER SUPPLY CO., Denver, as exclusive representatives for their air and hydraulic cylinders in the Denver and El Paso territory.

CONGRATULATIONS! — Massachusetts' oldest foundry, the HUNT-SPILLER MFG. CORP., Boston, is observing its 140th anniversary. They produce Diesel locomotive cylinder liners, piston rings, truck and bus brake drums and a wide variety of job shop work.

NEW ALLOY — EutecRod 155 is the new alloy being manufactured by the EUTECTIC WELDING ALLOYS CORP., New York. Having a bonding temperature of just 700°F, it is claimed to fill the need for a solder which operates at this medium temperature on both ferrous and nonferrous metals. Sizes available are 1/16, 3/32 and ⅛-in.

SPREADING OUT—Building K of the New Britain Machine Co. has been acquired by the STANLEY WORKS, New Britain, Conn., for about $100,000. This is the initial step which will eventually give Stanley Works possession of considerable adjoining property now owned by the machine company.

FREE HANDBOOK—The Shear Knife Handbook is now available without cost from the HEPPENSTALL CO., Pittsburgh. It is a 48-page glossary of information for those who specify, use, buy or grind metal-cutting shear knives.

SCRAP DEALER—A new company has been organized by Mendel Solomon, the M. E. SOLOMON CO. with offices at 902 Clark Bldg., Pittsburgh, to handle iron and steel scrap and plant dismantling. M. J. Spann and John C. Kaib will be associated with the firm.

SELLS RCA DETECTOR—The Radio Corp. of America, New York, has appointed the ERIEZ MFG. CO., Erie, Pa., as distributor for RCA electronic metal detectors. Eriez will handle all sales in the United States and Canada.

GROWING — The Valve Pilot Corp., New York, has been acquired by the BARCO MFG. CO., Chicago, both manufacturers of railroad equipment. Office and equipment of Valve Pilot will be moved to Barco's plant in Chicago.

Finnish Auto Market Opens With Lifting of Buying Permits

Washington—Barriers to American motor vehicle sales to Finland went down with its lifting of the government purchasing permit order recently. Now open is a potential 1950 market for at least 7000 passenger cars, 2000 trucks, and 1000 other vehicles.

More than 50 pct of Finnish passenger cars are older than 12 years and more than 1000 of 2800 buses are 10 years old or more. Most of the Finnish taxicab fleet is over age and needs replacing.

Although British, French, Russian, and Italian producers are trying to snap up good portions of available Finnish business, sources here indicate that if dollar credits can be arranged a lion's share of the potential 10,000 orders will go to American companies. Orders for 1600 passenger cars for '50 delivery have already been placed with American producers.

Smaller European cars have a noted price advantage over the American products in Finland. American cars sell roughly from $3,100 to $3,300 as compared with about $1,700 for French cars and $1,300 to $2,350 for British. Despite the price disparity, about 80 pct of Finnish pre-war cars were made in the United States.

Kropp Forge Business Climbs

Chicago — A flood of orders within the past 60 days has pushed the Kropp Forge Co. to capacity production but it still cannot keep abreast of heightened business, reports Roy A. Kropp, president. He said that monthly tonnage of forgings exceeds production of any month since the war and that he did not foresee any slackening of demand in the near future.

Particularly heavy are orders from the machine tool, aviation, and automobile industries, he said. Railroad and government arsenal orders have shown a marked increase.

Atlantic Steel Open House To Feature Customers' Exhibits

Atlanta — Customers will turn tables on the host company when they exhibit their agricultural implements at the 3-day open house of the Atlantic Steel Co. on May 4-6.

Atlantic Steel's open house theme is "Dixisteel on Dixie Farms," sounding a note of encouragement to farm machinery producers of the South supplied by Atlantic. Tours of the mill will take place during the 3-day period. The firm's entire warehouse will contain booths for customers' displays and a Country Store for Atlantic Steel products.

A Press Preview for Georgia newspapermen will be held on May 4. Farm Day will take place on May 5 for customers, stockholders, and friends, and Family Day on May 6. The company expects 15,000 to attend.

Dravo Corp. Business Volume Lags, Billings at Near Record

Pittsburgh—Although the Dravo Corp.'s 1949 business volume was reduced, billings of $49,737,894 were the second largest in the company's peacetime history. Best previous year was 1948 with $61,120,997.

Net income for 1949 was $2,998,084, or $5.88 per share, after preferred dividends, as compared with $4,195,825, or $8.28 per share in 1948. The company spent $2,427,871 for new plant and equipment, as compared to $2,124,567 the previous year.

St. Louis Office Opened

Cleveland—A St. Louis district office for Tinnerman Products, Inc., was opened on Mar. 1, reports H. R. Russell, general sales manager. Carl F. Marcussen, formerly of the Chicago office, is the new district manager.

Offices for the new Central States District are at 7614 Wydown Blvd., St. Louis 17. States included are Missouri, Kansas, and southwestern Illinois.

March Building Contracts In 37 States Hit New Record

New York—March contracts of $1,300,201,000 for construction in the 37 states east of the Rocky Mountains were the highest in history, reports the F. W. Dodge Corp., statistical firm. Toppled from its zenith position was the June 1942 record of $1,190,264,000.

March contracts were 67 pct over February's and 74 pct higher than March 1949's. The 1950 quarter's dollar and physical volume was also record-shattering. Contracts totaling $2,810,586,000 for 245,207,000 sq ft of new building space were awarded. They were 56 pct ahead of last year's 3-month total.

Residential building of $1,279,634,000 showed the largest increase, double that of 1949. Non-residential projects of $1,001,519,000 were 30 pct over the '49 mark and heavy engineering rose 25 pct to $529,433,000.

Residential contracts for March '50 were $574,681,000, or 128 pct over March '49. Non-residential awards were $500,658,000 and heavy engineering, $224,862,000.

That's right dear. I hung your picture right in front of my desk.

Cold Rolled Sheet Tonnage Highest of Any Steel Product

New York — Cold rolled steel sheet shipments in 1949 for automobile, refrigerator and other consumer goods industries totaled more in tonnage than any other steel product. The '49 shipments of nearly 6,887,000 tons topped '48 shipments by a fraction although total steel outgo slumped 12 pct, reported the American Iron and Steel Institute. They were 11.8 pct of total steel shipments.

Record-making steel pipe shipments stood at 6,935,220 net tons in 1949, an increase of 53,671 tons. It constituted 12 pct of steel shipments as compared with 10.4 pct in '48.

Line Pipe Ranks First

Formerly second or third in pipe tonnage, line pipe moved to first place in rank in '48 and widened its lead last year. It is now in demand for stimulated building of long distance oil and gas pipe lines.

Galvanized steel sheet shipments showed the tallest gain in '49, 1,755,000 tons, or 112,000 tons more than '48. Electrolytic tin plate outgo exceeded those of hot-dipped tin and terne plate for the first time. Total tin plate was 6.3 pct of all steel shipments.

Westinghouse Sets Safety Record

Pittsburgh — For every hour worked by the 92,500 employees of the Westinghouse Electric Corp. in 1949 the odds against incurring a disabling injury were 220,000-to-1 on the basis of a new Westinghouse safety record. T. O. Armstrong, director of plant labor relations, claimed that the record was 25 pct better than the electrical equipment average.

He added that Westinghouse's 1949 record was about 75 pct better than the accident frequency rate of industry in general. The company's 1949 accident-severity rate was 20 pct better than for the electrical industry as a whole and nearly twice as good as the record for all industry.

STEEL PROFITS—Drop Little Despite Strike

Strike impact withstood as 26 firms, or 92 pct capacity, earn $510,240,409 for only 2.3 pct drop . . . Modernization, planning big factor . . . December price hike barely felt.

Pittsburgh — Despite the pension strike last fall, 1949 net earnings of 26 steel companies with 92 pct of the industry's ingot capacity declined only 2.3 pct from the previous year.

The decline in earnings, less, proportionately, than the 9.2 pct slump in net sales and operating revenue, reflected the industry's ability to shake off the depressing effect of a month-long shutdown, and increased operating efficiency through modernization and better production planning. The steel price increases of last December were scarcely felt.

Profits Total $510,240,409

Net income for the 26 companies was $510,240,409, as compared with $522,471,317 in 1948. Net sales and operating revenue was $7,134,776,400 as against $7,861,587,539 for the previous year. Net income as a percentage of sales was 7.2 pct for 1949, and 6.7 pct for 1948, an increase of 7.5 pct.

On an industry-wide basis, net income was approximately $551 million, and net sales and operating revenue $7.7 billion, as compared with approximately $575 million and $8.5 billion, respectively, in 1948.

Investment Encouraged

Indicating the industry's increased awareness that stockholders must receive a good return on their investment if more equity capital is to be attracted to the business, common dividends declared were up 10.3 pct in the face of the decline in earnings. This is in contrast to 1948 when common dividends rose only 7.1 pct despite a 32.4 pct increase in earnings over 1947.

Provision for federal income taxes was off 2.2 pct, but the amount set aside for this purpose was still $6.88 per ton of steel shipped. In dollars, the figure was $365,980,188, as compared with $374,392,768 in 1948.

Shipments Fall 11 pct

Steel shipments declined about 11 pct, along with the drop in ingot production. The surplus accounts of the 26 companies were up an average of 13.1 pct, while invested capital rose 7.0 pct, and working capital 8.3 pct. Invested capital per ton of ingot capacity was up 4.9 pct. The industry operated at 81 pct of capacity in 1949, compared with a 94 pct rate in the previous year, according to the American Iron & Steel Institute. This was a decline of 13 points, or 13.8 pct.

Profits False Picture

To steel executives the reported net earnings of the companies do not reflect a true picture. They are overstated. They are still carrying on a running battle with the U. S. Treasury Dept. over allowance for depreciation. They say it should be related to the cost of replacement, not on original cost as the law now is interpreted. They are hopeful of winning the battle.

E. T. Weir, chairman of National Steel Corp., is particularly outspoken on this point. National's annual report showed a charge of $25,021,857 for depreciation, even though $11,850,000 of this received no tax benefit. Mr. Weir said that if the eight leading steel companies other than National had charged off depreciation as did his company, provision for this purpose would have shown a total increase of $130 million with a corresponding total reduction in net profits.

The Top Twelve

Pittsburgh—Net income, in thousands of dollars, of 12 steel companies rated in order of reported 1949 profits, with percent of change from 1948 is as follows:

	1949	1948	Pct of change
U. S. Steel Corp.	165,908	129,627	+28.0
Bethlehem Steel Corp.	99,283	90,347	+ 9.9
Republic Steel Corp.	46,142	46,438	— 0.6
National Steel Corp.	39,311	40,121	— 2.0
Youngstown Sheet & Tube Co.	31,777	35,711	—11.0
Armco Steel Corp.	30,918	32,030	— 3.5
Inland Steel Corp.	25,013	38,606	—35.2
Jones & Laughlin Steel Corp.	20,961	31,222	—32.9
Colorado Fuel & Iron Corp.	10,182	6,181	+64.7
Wheeling Steel Corp.	7,896	15,050	—47.5
Keystone Steel & Wire Co.	5,084	4,167	+22.0
Portsmouth Steel Corp.	4,885	4,511	+ 8.3

Brazil Ore Reserves Discussed

Brazil—Estimated at 50,000 million tons of proto-itabrite, or banded iron stone with 45-55 pct of iron, Brazil's largest reserves of iron ore lie in Corumba, Mato Grosso, said Dr. Otavio Barbosa at a meeting of the Brazilian Society for the Progress of Science.

He said that the reserves of the Urucum Mountains alone will yield 3700 million tons and that another 100 million tons with an iron content of 60-65 pct are stored on the mountain slopes.

Feb. Increase Reported for Massachusetts Business Level

Boston—A rise of 1.5 pct in the volume of new orders placed in February over January 1950 is reported by the Associated Industries of Massachusetts. Currently new orders are running about 11 pct ahead of last year.

The actual strength of February demand was in the durable goods lines, principally fabricated metals, electrical products and all others. While orders for machinery declined again in February from the previous month, the volume of new orders was 15 pct larger than in February 1949.

Both durable and non-durable goods reflected about equal gains in February 1950 as compared with February 1949.

Sells Bonds to Finance Project

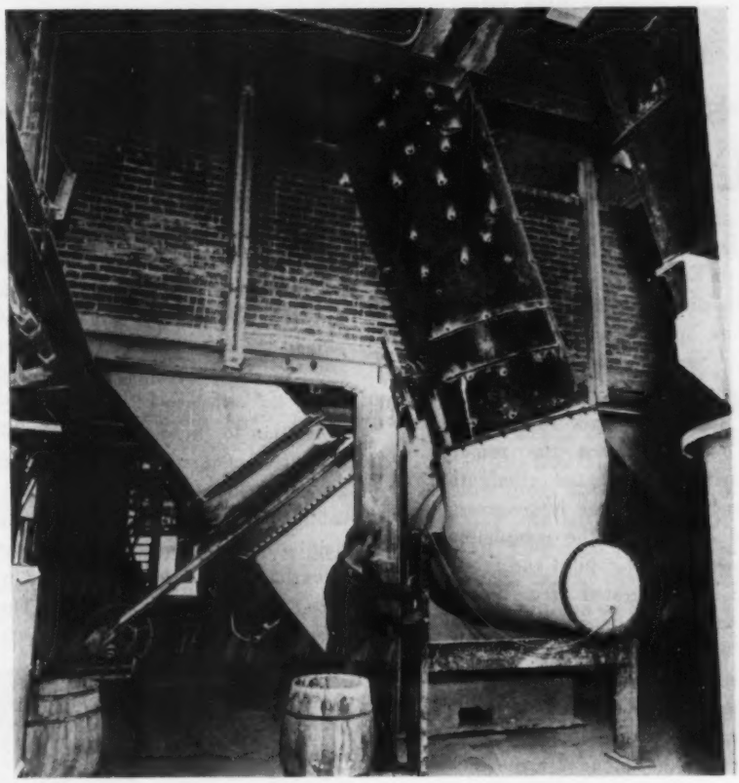
Pittsburgh—To aid financing of the firms post-war plant improvement project, the Jones & Laughlin Steel Corp. will issue a $40 million bond issue to six life insurance companies. The First Boston Corp. was the steel company's agent in negotiations. The insurance firms agreed to purchase first mortgage bonds, series B, 3 pct, due June 15, 1975. Bonds will be sold at par.

Casting Progress Described

Cleveland — New developments in the manufacture and use of Meehanite metal castings were discussed by A. C. Denison, president of Fulton Foundry & Machine Co., and Dr. C. R. Austin, director of research, Meehanite Metal Corp., New Rochelle, N. Y., before a technical dinner here.

Awards Auto Parts Contracts

Washington — The Army Dept. has awarded contracts totalling more than $985,000 for the supply of automotive spare parts as follows: South Western Gear Works, Houston, $151,500; Oakland Truck Sales, Inc., River Rouge, $252,600; and Chrysler Corp., Detroit, $580,-944.



New Ducting Installation Eases Problems

New York—Simple measures for the laborious task of insulating impossible-to-puncture, difficult-to-band cylindrical ducting are offered by the Industrial Mineral Wool Institute.

The new technique deals with the irksome problems of not being able to puncture tubing with nuts, bolts, screws, or wires or not being able to band it because of location and shape. Often ducting units are too large for pre-formed pipe insulation and the surface curvature is too great to permit insulation to be temporarily stuck in place for strapping. The technique is:

(1) Dirt, grease, and other extraneous material is cleaned from the duct surface of the duct with a wire brush.

(2) Eight-inch lengths of galvanized wire are spot welded to the surface of the duct.

(3) One-inch thick mineral wool blankets, supplied sandwiched between expanded metal lath and light-gage galvanized wire mesh, are impaled on the projecting wires. The expanded lath faces out and the protruding galvanized wires are bent over to hold the insulation.

(4) Sections of blanketing are laced together at the edges by galvanized wires entwined in the lath.

(5) Finally, the blanket is covered with a one-half-inch layer of mineral wool insulating cement trowelled over the surface of the expanded metal lath.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Solution from Afar"

LAST October, Paul Hoffman, speaking to a group of delegates from ECA countries, urged the economic integration of western Europe to avoid chronic dependence upon America. This proposal was spelled out in greater detail by Senator Tom Connally in February.

Integration, according to Senator Connally, meant the removal of tariff barriers, the elimination of trade quotas, the interconvertibility of currencies, the completely free movement of capital and labor within the integrated area. This would create a single market of 288 million consumers, permit a high degree of regional specialization, promote the most efficient use of natural resources. Look at what integration has done for the 48 states of this country.

This seems to make sense to the average American. If western Europe would bury its rivalries, it would no longer have to look to this country for alms.

It is therefore surprising to some of us, 3000 miles from the European laboratory, in which Paul Hoffman proposes to accelerate economic progress, to learn that intelligent opinion on the spot views this proposal with considerable misgiving.

An elimination of barriers on the scale proposed by the ECA administrator would mean in the first place, a vast migration of workers. The population of western Germany has risen from 184 to 351 per sq km. It has 9 million refugees to feed. The population of Italy is increasing at the rate of 500,000 per year. With the removal of frontiers, it is certain that millions would leave the areas of present congestion and seek new homes and jobs elsewhere. Belgium and Switzerland would be exposed to a literal mass invasion which would present the most formidable problems in housing, labor, relief and politics.

For years the leaders of western Europe have struggled with the tough problems of national security, adequate food and steady employment. Security demands emphasis upon self sufficiency. Each country must be in a position to make its own arms. This requires protection for industries, which, under free competition in an integrated western European economy, could not survive. Dependence in time of war upon local food supplies has led to farm subsidies to obtain maximum production. The encouragement of native industry has provided jobs.

If boundaries disappear and local protection vanishes, thousands of plants will close because the products they formerly made can be turned out more cheaply in larger units located to exploit special regional advantages. Whatever the long time gains of integration may be, the immediate effects would certainly be confusion, drastic readjustments, greatly increased unemployment and widespread hardship.

Added to the foregoing is the problem of political unity. Is economic integration possible without a single sovereign? What happens when the free enterprise philosophy of Belgium and Switzerland collides with the socialist dogma of the British Labor Party?

However, our friends in Europe make this suggestion: If we insist on integration and believe so firmly in its benefits, why not integrate the American economy with that of western Europe? Why not add Europe's 288 million consumers to our own 150 million? If a little bit of this medicine is so good, why can't a little bit more be better?

Judge Prolongs Lustron Corp. Existence Despite Monthly Loss

Columbus, Ohio — Lustron Corp.'s housing plant will continue operating in receivership indefinitely, despite an anticipated monthly loss of $150,000 to $180,000. United States District Judge Mell G. Underwood last week granted the request of Reconstruction Finance Corp. to keep the plant going.

Judge Underwood said, "If it is indicated to the court that houses can't be sold, the plant will be closed immediately. We are not continuing operations just to keep people employed."

RFC foreclosed on Lustron last February, alleging the firm was in default on loans totaling $37,500,000. Lustron has been operating under Clyde G. Foraker, a receiver, for a 30-day period of operation which was to end Apr. 5.

Don Boylan, Lustron comptroller, told the court the plant was operated during the past months at a loss of between $120,000 and $150,000. If 72 houses are produced in the next 30 days, the loss will increase to between $150,000 and $180,000.

Westinghouse Plans to Sell Workers 500,000 Common Shares

Pittsburgh—A special issue of 500,000 common stock shares will be sold to Westinghouse Electric Corp. employees at below market prices. Employees may enroll in the plan up to Apr. 20 or at 6-month intervals thereafter and may buy stock at $4 a share under the average market price of the first 20 days of October 1950.

Stock will not be sold at more than $35 per share nor less than $25, subject to change in the succeeding 6-month period. Workers may buy up to 125 shares in a year's time. Payments will be deducted from the payroll at not less than $2 per week for weekly-paid workers, $9 a month for those paid monthly and semi-monthly.

Installments may not total more than 12 pct of employee earnings.

Alcoa Blames $7 Million Profit Drop to 52-Day Strike

Pittsburgh—A loss of $7 million in profits was charged to the 52-day strike last fall against its nine plants by the Aluminum Co. of America in its annual report.

Other income-cutting factors factors listed were water shortage for hydroelectric plants, the mid-year business slump, and costs of breaking in and organizing the new sheet and plate rolling mill at Davenport, Ia. The firm's net income was $24,218,404 as compared with $39,969,145 in 1948.

Arthur V. Davis and Roy A. Hunt, chairman and director, reported that prospects for the first half were encouraging.

Marshall Plan Money Helps Boost European Steel Output

Washington — Marshall Plan money for the modernization of western European steel plants has helped raise output 50 pct but no funds have gone directly to projects increasing the area's steel-making capacity, according to the Economic Cooperation Administration's first two years' report.

The ECA paid about $167 million in 21 modernization projects which cost a total of $711 million. Steel ingot and castings production spiralled up to 46 million tons in '49 from about 30 million in 1947. Pig iron and ferroalloy output rose from 22 million tons to about 35,500,000.

The ECA also approved expenditures of $43 million for rebuilding and improving four mines in Norway, Austria, France, and Turkey to expand iron ore production. ECA's share was $12 million.

ECA said that no "overall program for enlarging European steel-making facilities is planned but counterpart funds will be approved for this purpose. Steel firms have used unspecified sums for construction of new capacity.

As a result, western European steel capacity has increased by about 8 million tons or about 20 pct. About 4 million tons is accounted for in Britain and 3 million in France. Most of this, ECA said, has been offset by decreases in western Germany.

A corresponding increase in blast furnace capacity is underway through rebuilding and enlarging furnaces and adding new facilities.

Counterpart funds went for buying American-made equipment to expand rolling capacity. Greatest expenditures have been for providing modern continuous and semi-continuous strip mills for hot rolled sheets, replacing slower hand mills.

SKF's Batt Named Director

New York—Election of William L. Batt, Philadelphia, as a director of American Standards Assn. was announced recently. Mr. Batt, president of SKF Industries, Inc., took a leading part in the standardization campaign that united the United States, Great Britain, and Canada on dimensions of ordinary screw threads for most of the world's machinery.

William L. Batt

As chairman of the Sponsors Council on Unification of Screw Threads, Mr. Batt was influential in securing international agreement to end 30 years of sporadic negotiations and more than 80 years with divergent screw threads.

Fixture Shipments Rise

Washington — Fourth quarter shipments of porcelain enameled steel fixtures amounted to $11.7 million, according to the Porcelain Enamel Institute.

The number of units shipped was more than 400,000, or about 18,000 and $60,000 better than for the third quarter, and $4 million ahead of the first quarter of 1949.

Avildsen Outfits New York's Only Twist Drill Making Plant

Federal Drill and Tool Div. produces sizes ½ in. and under

New York—Preliminary limited production in this city's sole plant producing twist drills will swell to 500,000 per month when equipment worth $½ million is completely installed.

On 52,500 sq ft of floor space at 94 Lafayette St., the new Federal Drill and Tool Works Div. of Avildsen Tools and Machines, Inc., will manufacture high-speed industrial drills in sizes ranging up to ½ in. and aircraft industry precision tools for the two Avildsen sales subsidiaries, Republic Drill and Tool and Celfor Tool.

The New York plant will supplement Avildsen's Chicago Div. Cooperation between the two plants will serve as a balancing factor for excess work. If the Chicago arm has surplus work in one process, the tools will be shipped to New York.

Focal Point of Market

At present, the Chicago plant builds machinery for other twist drill producers. Eventually this function will be transferred to New York. The Chicago branch produces drills ½ in. and over.

Martin C. Fee, vice-president, said that Frank Sikavorsky, president of the Federal Twist Drill Div. of Avildsen, will serve as New York general manager. Mr. Sikavorsky has been in the field for 30 years and is the former president of the Ampco Twist Drill Co., Michigan.

Mr. Fee commented that most leading cities contain a twist drill industry and are able to support it. New York can be considered a focal point for the Eastern market for drills, the largest in the country, he said. Production in the New York plant will be a time-saving factor in transportation and handling of finished products. He also stated that New York is a strategic location for the production of aircraft industry precision tools.

= NO Down-Time

Plant Superintendent looks at

MONARCH SOLID TIRES

No down time for tire maintenance—right! But that's only part of the story. Monarch Solid Tires have an extra long service life, so they lower materials handling costs that way, too. They're tough, stable, sure-footed, and they can't puncture—Monarch-equipped vehicles go anywhere in the plant.

Monarch specialization pays off for you in better industrial tires, including such special types as Monarch Easy-Roll, Cushion, Static Conductor, and Neoprene Tires.

Write for specific information on the use of Monarch Solid Tires in your plant. THE MONARCH RUBBER CO., 301 Lincoln Park, HARTVILLE, OHIO.

Specify Monarch Solid Tires on your industrial vehicles. Replacement tires available from the manufacturer of your equipment.

MONARCH

Specialists in Industrial Solid Tires and Molded Mechanical Rubber Goods

• ***News of Industry*** •

Construction Steel News

Fabricated steel awards this week included the following:

6225 Tons, Harrisburg, Pa., State Highway & Bridge Authority, to Bethlehem Steel Co., Bethlehem.

5200 Tons, Cleveland, Ford Motor Co., Engine plant, to Bethlehem Steel Co.

4600 Tons, Washington County, Pa., Belle Vernon bridge, State Highway & Bridge Authority, Fort Pitt Steel Co., Pittsburgh, low bidder.

2500 Tons, Union County, N. J., New Jersey Turnpike Authority, Del Balso Construction Co., New York, low bidder.

320 Tons, Everett, Mass., Esso Standard Oil Co., Everett Refinery, pipe bridges, through Esso Standard Oil Co. (contractor) to A. O. Wilson Structural Steel Co., Cambridge, Mass.

315 Tons, Grays Harbor Co., Wash., Humptulips River and overflow bridges, through Sealand Construction, Inc., Seattle, to Western Consolidated Steel Corp.

313 Tons, New Haven, Conn., 3 span composite welded girder bridge, relocation of U. S. Route 1, D. V. Frione and Co., Inc., New Haven, low bidder.

310 Tons, Boston, Mass., Research Building for Massachusetts General Hospital, through Turner Construction Co., to A. O. Wilson Structural Steel Co., Cambridge, Mass.

245 Tons, Oaks, Pa., B. F. Goodrich Co., to Belmont Iron Works, Inc., Philadelphia.

240 Tons, Newburyport, Mass., building for Hytron Radio and Electronics Corp., through Leslie R. Porter Co., Beverly, Mass., to A. O. Wilson Structural Steel Co., Cambridge, Mass.

235 Tons, Goodland, Kan., bridge for Chicago, Rock Island Pacific RR., to Vierling Steel Works, Chicago.

230 Tons, Warren County, N. J., New Jersey Dept. of Highways, A. S. Wickstrom, Skaneteles, N. Y., low bidder.

185 Tons, Watertown, Wis., bridge at North Second St., to Milwaukee Bridge Co., Milwaukee.

160 Tons, Lancaster, Pa., Watt & Shand, store building, to A. B. Rote Co., Lancaster, Pa.

150 Tons, Wright Field, Ohio. Seavenger Building, to Berger Mfg. Div., Republic Steel Corp., Canton, Ohio.

145 Tons, Cambridge, Mass., power station at Kendall Sq. for Cambridge Electric Light Power Co., plant unit No. 2 through F. Leroy Fox, Boston, to A. O. Wilson Structural Steel Co., Cambridge, Mass.

125 Tons, Emeryville, Calif., General Electric Supply Corp. warehouse, through Parker, Steffens & Pearce, to Bethlehem-Pacific Coast Steel Corp.

100 Tons, Bloomington, Ill., Dormitory Building for Illinois State Normal Teachers College, to Mississippi Valley Structural Steel Co., Decatur, Ill.

Fabricated steel inquiries this week included the following:

20,610 Tons, Passaic County, N. J., Passaic River bridge, New Jersey Turnpike Authority, due Apr. 27.

15,500 Tons, Hackensack, N. J., Hackensack River bridge, New Jersey Turnpike Authority, due May 4.

568 Tons, San Diego, A.T.& S.F. RR. Co. bridge No. E-264, San Diego River and Mission Bay, Los Angeles District, Corps of Engineers, CIVENG-04-353-50-31, bids to May 2.

258 Tons, Shasta Co., Calif., bridge across Clear Creek between Anderson and Redding, California Div. of Highways, Sacramento, bids to May 3.

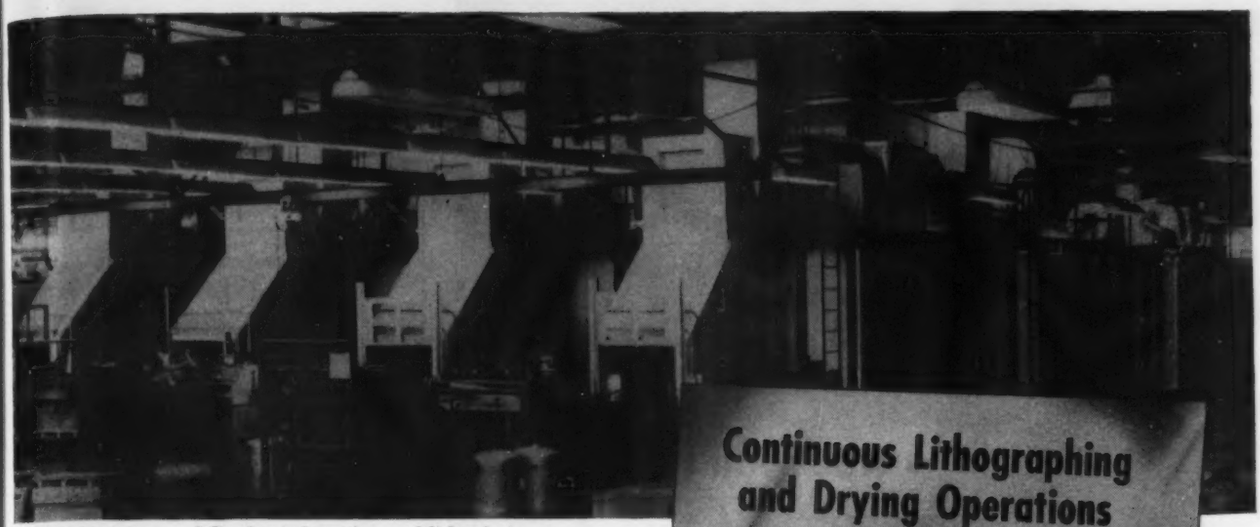
120 Tons, New Castle, Del., Delaware Dept. of Highways, due Apr. 26.

Reinforcing bar awards this week included the following:

1000 Tons, Kenosha, Wis., Nash Motors Building, through The Austin Co., Cleveland, to Bethlehem Steel Co.

510 Tons, Los Angeles, improvements to Live Oak, Wash., CIVENG-04-353-50-28, through Gould & Cross, Gardena, Calif., to Judson-Pacific-Murphy Corp.

440 Tons, Chicago, Congress Street bridge su-



Four of the battery of Gas heated coating and litho drying ovens at American Can Company. Easily accessible, automatic temperature controls actuate the units, and the circulating fans mounted on top of 105-ft. ovens. The ovens utilize the latest principles of forced convection heating.

Continuous Lithographing and Drying Operations at AMERICAN CAN COMPANY

SHOW HOW *GAS* KEEPS PRODUCTION RATES FROM LAGGING

PRODUCTION BOTTLENECKS in making metal containers have been overcome by reducing the time required for coatings and printing inks to dry. Inside coating prevents chemical action between can and contents, outside printing identifies it. Since the consumption runs into several hundred million cans per year, rapid automatic production machinery is required, and drying operations must keep pace with it.

Efficient and flexible GAS has done just this at the new St. Louis, Mo., plant of American Can Company. Here, Gas-fired convection ovens gear the drying cycle to the production speed of lithographing and coating lines. Heaters in these drying ovens are direct Gas-fired external type, supplied with inspirator cluster burners, accurately and automatically controllable to meet requirements of the process. The litho drying ovens have three heat zones—two at 300-325° F. for drying—and a third for preheating the conveyor. Coating ovens have three drying zones, automatically regulated to temperatures of 300° to 420° F., and a conveyor heating zone, but are otherwise like the litho ovens.

After the flat sheets are printed, coated and dried, they are cut into blanks for forming. GAS melts the solder used to close the longitudinal seams, and as the cans move along the conveyor, a series of small GAS flame jets play on the seam to effect a satisfactory seal.

By stepping up the drying cycle in metal container manufacturing, GAS fulfills another of its major productioneering roles. It's this effective use of flexible, precisely-controlled Gas Equipment which overcomes so many heat-processing slowdowns. Your Gas Company Representative will show you how it can be done.

MORE AND MORE... THE TREND IS TO GAS

AMERICAN GAS ASSOCIATION
420 LEXINGTON AVENUE
NEW YORK 17, NEW YORK

Steel sheets are fed through the tandem printing presses (foreground) and then into the litho drying ovens.

After lithographing, the plates are varnished in this press, and conveyed to the litho oven.

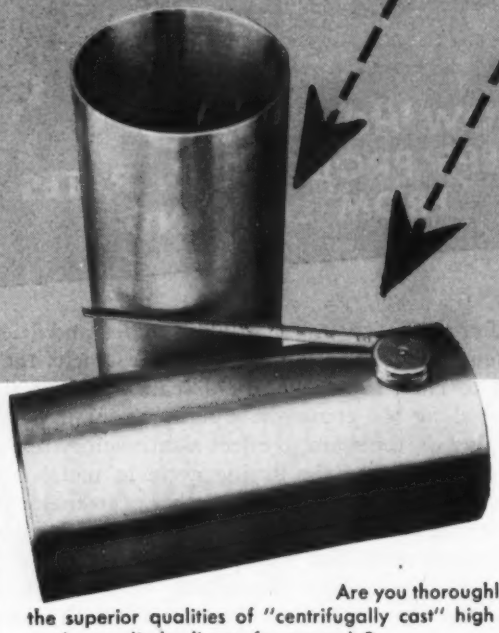
DURASPUN

18-8 Cylinder Liners

• True diameters

• True wall thicknesses

• Tough, close-grain metal



Are you thoroughly familiar with the superior qualities of "centrifugally cast" high alloys . . . such as these cylinder liners, for example?

Centrifugally cast metal is exceptionally uniform, close-grained and strong. It is free of pits and pockets. It is capable of passing very rigid tests. And the practical advantage is that as long as there is a central circular hole, almost any outside shape can be cast. Some of our customers want their castings centrifugal even though considerable boring and other machining is necessary to finish the piece.

We recommend our centrifugal casting service if your requirements call for the characteristics outlined above. Our high alloy foundry is modern in every respect and staffed by metallurgists and foundrymen of many years' experience with both centrifugal and static castings.

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perstructure, to Ceco Steel Products Co., Chicago.

330 Tons, Chicago, Illinois Masonic Temple, through J. W. Snyder Co., Ceco Steel Products Co., Chicago.

230 Tons, Kansas City, Kans., transfer house for International Harvester Co., to Sheffield Steel Corp., Kansas City.

195 Tons, Cleveland, 55th Street Bridge to U. S. Steel Supply Co., Chicago.

165 Tons, Chicago Heights, Ill., Illinois Bell Telephone Corp. building, to Joseph T. Ryerson and Son, Chicago.

151 Tons, New Haven, Conn., 3 span composite welded girder bridge, relocation of U. S. Route 1. D. V. Frione and Co., Inc., New Haven, low bidder.

122 Tons, Oak Forrest, Ill., Recreation building, to Olney J. Dean Steel Co., Chicago.

108 Tons, Grays Harbor Co., Wash., Humptulips River and overflow bridges, through Sealand Construction, Inc., Seattle, to Bethlehem Steel Co.

105 Tons, Chicago, Church of The Epiphg. to Olney J. Dean Steel Co., Chicago.

Reinforcing bar inquiries this week included the following:

1012 Tons, Los Angeles, drainage area improvements, Sawtelle-Westwood (channel) system, Los Angeles District, Corps of Engineers, Ser. CIVENG 04-353-50-32, bids to May 2.

485 Tons, Los Angeles, Hollywood Freeway construction between Western Ave. and Virgil Ave., California Div. of Highways, Los Angeles, bids to May 4.

385 Tons, Chicago, Wellington Avenue Apts.

350 Tons, Williamsport, Pa., Flood Protection Unit 6-C.

320 Tons, Allegheny County, Pa., Pennsylvania Turnpike Section 31-C.

155 Tons, Gary, Ind., Budd Co., plant superstructure.

119 Tons, Shasta Co., Calif., bridge across Clear Creek, etc., between Anderson and Redding, California Div. of Highways, Sacramento, bids to May 3.

110 Tons, Washington, Fayette, and Westmoreland Counties, Pa., Belle Vernon Bridge.

100 Tons, Dravosburg, Pa., bridge.

Assembly Line

Continued from Page 67

mounted on the instrument panel; sliding-type fabric top; off-center split in the front seat; sliding, drawer-type dash locker; novel front suspension; rotary door latches; unitized body-and-frame construction. In contrast to other existing Nash models, the notch-type or bustle back body styling is used.

Features New Style Door

Instead of the conventional door construction, Nash is making only the lower half of the door in the usual manner. For the top half of the door, an extruded aluminum member is used that is approximately 1⅞ in. wide. This member gives additional stiffness and also contains the channel for the glass. It eliminates a considerable amount of interior and exterior trim. Moreover, this construction probably eliminates a third of the steel ordinarily required for a

LOW COST — HIGH PRODUCTION

HARTFORD *Special*

Automatic Thread Roller

This Automatic Thread Roller is designed to solve standard and special thread rolling problems on small size screws from .086″ to .190″ in diameter with thread length capacity from ⅛″ to 1½″, rolling consistently to Class 3 Thread Fit. Careful engineering and rugged construction make it capable of continued high production runs with startling economy.

The "Hartford Special" Automatic Thread Roller incorporates such outstanding features as Completely Automatic Feed, Filtered Lubrication System, "Table Top" Working Level, Vibration-Free Operation, plus many more.

Our engineering staff is always available to help you work out your thread rolling problems. Write now for complete information.

HARTFORD *Special*

Automatic Drilling and Tapping Machinery • Swaging Machines
Die Polishing Machines • Contract Machine Work • Gears • Cams
"Super-Spacers" • "Four-Point" Milling Vises • "V-Block" Milling Fixtures

THE HARTFORD SPECIAL MACHINERY CO.
287 Homestead Ave., Hartford 5, Conn.

Please send me free Bulletin TR-100 describing your Automatic Thread Roller.

Name _____ Pos. _____

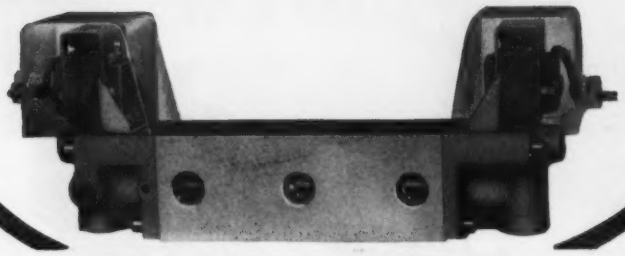
Company _____

Address _____

2 City _____ Zone _____ State _____

another NEW Quick-As-Wink development

Type "DS" double solenoid pilot operated single plunger control valve



▶smaller, shorter stroke solenoids — lower amperage
▶simpler electrical controls — high air economy...

● Small solenoids traveling through only a ⅛" stroke move small pilot valve plungers to apply air to operating pistons that move the main valve plunger back and forth. All operating parts are rugged, yet weigh only a few ounces. Reduced amperage eliminates intermediate relays, simplifying control circuits. Positive high cycle operation, without destructive impact, reduces maintenance and minimizes trouble due to voltage variations. ⅜" to 2" sizes. 2, 3, and 4-way actions. Solenoid control both directions or automatic return in one direction.

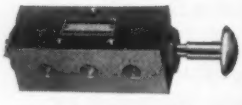
Send for Data Sheet No. 1611. It gives full details.

Individual DATA SHEETS for Each Valve —give complete details. Write today!

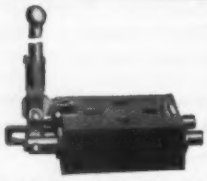
Hand Operated Air Valves—wide variety of uses. 2-way, 3-way, 4-way neutral position and compound exhaust.

Foot Operated Air Valves—workman has both hands free, speeding production. 2-way, 3-way and 4-way actions.

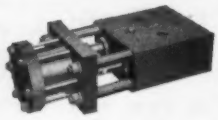
Single Plunger Valves—for air or low pressure hydraulic service. Lever, pilot, cam, diaphragm or solenoid operated. 2-way, 3-way, 4-way actions.



Series "O" and "OE" Valves—for air or hydraulic service up to 125 PSI. Push-pull, cam, pilot, diaphragm and solenoid operated. ⅛" and ¼" pipe connections. 2-way, 3-way, 4-way and 5-way actions.



Hydraulic Valves—Up to 5000 PSI. Conservatively rated. ½", ¾", 1" and 1½" sizes. 2-way, 3-way, 4-way actions.



Hydraulic Valves—Up to 5000 PSI. Pilot cylinder operated. ½", ¾", 1", 1½" 2", 2½", 3" and 4" sizes. 2-way, 3-way, 4-way actions.

Quick-As-Wink Control Valves

THE HIGHER THE PRESSURE THE TIGHTER THE SEAL

Manufactured by **C. B. HUNT & SON, Inc.**

1912 East Pershing Street, Salem, Ohio

Assembly Line

Continued

door. Dies are much simplified since the most complicated dies in a car are the cam dies used to form the upper door. Nash engineers have estimated a savings of at least $125,000 in dies on the convertible model alone through this new type of construction.

The top fabric is supported by four top bows that ride in a track in the structural rails. The top is actuated by small nylon-covered steel cables attached to a drum located behind the rear seat. The space occupied by the sliding top is considerably less than the space occupied by the conventional folding top.

Instruments are located in a panel directly forward of the steering wheel. The instruments include speedometer, fuel gage and temperature indicator. The gage-type oil pressure indicator is replaced by a signal light. Clutch pedal starting is retained.

Other Innovations

Nash has a new method of trapping rain water and a simplified blower arrangement for its Weather Eye. A new type radio is mounted at the center of the instrument panel. Speaker openings are framed by a series of chrome-plated buttons. Some interesting cowl vents at each side of the hood are primarily decorative.

The front suspension is unique. Coil springs are not connected midway in the lower control arms but instead are installed between the top of the steering knuckle and a high point of the front body structure, just inside the front wheel. In this location, the front wheel springs take nearly direct wheel loads and shocks; front suspension linkage has only to maintain wheel alignment and take side thrusts. Shock absorbers are located within the coil springs and the usual massive front suspension crossmember is eliminated. The front of the engine rests on a new motor support crossmember. This suspension can be used only on frameless cars.

Resume Your Reading on Page 113

HYDRAULIC SYSTEM KEPT LIKE NEW

Sunvis 916 Effects Substantial Savings; Strainers and Lines Kept Sludge-Free

A copper tubing manufacturer uses an oven with hydraulically operated doors to heat billets to approximately 1550F. The ambient temperatures around the hydraulic mechanism are abnormally high, putting the hydraulic fluid to a severe test of stability. Failure of the system would halt the piercing operation and result in costly delays throughout the plant.

Since the oven was first put in operation, three years ago, the hydraulic fluid has been Sunvis 916. The original charge has never been changed and is still in excellent condition, though the system is tight and requires only a minimum of make-up. Oil lines and strainers are completely free of sludge. Seals and packings are sound. Operations are never interrupted for oil changes or parts maintenance. The company expects to retain the original charge of Sunvis 916 in service indefinitely, effecting large savings in both oil and maintenance costs.

Sunvis 916 is a solvent-refined oil of the highest quality. It is fortified to resist the oxidation and sludging so detrimental to the efficient operation of hydraulic systems. Sunvis 900 Oils are *good for the life of your machines.* For your copy of the illustrated booklet "Sunvis 900 Oils" write Department IA-4.

SUN OIL COMPANY · *Philadelphia 3, Pa.*
In Canada: Sun Oil Company, Ltd.
Toronto and Montreal

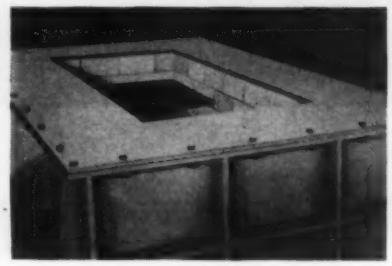
SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY

SUNOCO®

GALVANIZING by induction *

Seven ton capacity Ajax Low Frequency Induction Furnace now in use for Hot Dip Galvanizing.

another AJAX First



Showing the heavy refractory brick lining walls containing the molten zinc. No iron kettle is used.

Now Ajax engineers have developed a galvanizing furnace lined with an inert refractory material. The melt is internally heated by the electric induction principle introduced by Ajax more than thirty years ago. Costly iron kettle replacements and dross formation from iron kettle are eliminated. Internal circulation assures complete uniformity of temperature.

FASTER PRODUCTION • UNIFORM QUALITY
LESS MAINTENANCE • LOW OPERATING COST
ABSOLUTE TEMPERATURE CONTROL • LONG LIFE • REDUCED DROSSING • NO HOT SPOTS
SMALLER ZINC BATH POSSIBLE

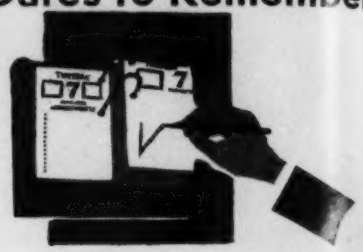
*

AJAX ENGINEERING CORPORATION
TRENTON 7, N. J.

AJAX TAMA-WYATT INDUCTION MELTING FURNACE

Associate Companies: **AJAX METAL COMPANY,** Non-Ferrous Ingot Metals and Alloys for Foundry Use **AJAX ELECTROTHERMIC CORP.,** Ajax Northrup High Frequency Induction Furnaces **AJAX ELECTRIC CO., INC.,** The Ajax-Hultgren Electric Salt Bath Furnace **AJAX ELECTRIC FURNACE CORP.,** Ajax-Wyatt Induction Furnaces for Melting

Dates to Remember



Apr. 10-14—American Society of Tool Engineers, Industrial cost-cutting exposition, Philadelphia Convention Hall, Philadelphia. Society headquarters are at 10700 Puritan Ave., Detroit.

Apr. 12-14—American Society of Mechanical Engineers, spring meeting, Hotel Statler, Washington. Society headquarters are at 29 W. 39th St., New York.

Apr. 12-14—National Petroleum Assn., semiannual meeting, Cleveland. Association headquarters are in Munsey Bldg., Washington.

Apr. 13-14—American Machine Tool Distributors Assn., spring meeting, Edgewater Beach Hotel, Chicago. Association secretary is Thos. A. Fernley, Jr., 505 Arch St., Philadelphia.

Apr. 24—Packaging Machinery Manufacturers Institute, semiannual meeting, Hotel Sheraton, Chicago. Institute headquarters are at 342 Madison Ave., New York.

Apr. 25-26—Metal Powder Assn., annual metal powder show, Book-Cadillac Hotel, Detroit. Association headquarters are at 420 Lexington Ave., New York.

Apr. 27-28—American Steel Warehouse Assn., annual meeting, Shamrock Hotel, Houston. Association headquarters are at 442 Terminal Tower, Cleveland.

May 4-5—National Machine Tool Builders' Assn., spring meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 10525 Carnegie Ave., Cleveland.

May 8-12—American Foundrymen's Society, annual convention and exhibition, Public Auditorium, Cleveland. Society headquarters are at 222 W. Adams St., Chicago.

May 10-12—Machinery Dealers' National Assn., annual convention, Hotel Statler, Detroit. Association headquarters are at 20 N. Wacker Drive, Chicago.

May 15-17—Industrial Furnace Manufacturers Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are at 420 Lexington Ave., New York.

May 22-24—American Supply & Machinery Manufacturers' Assn., Industrial supply convention, Convention Hall, Atlantic City, N. J. Association headquarters are at 1108 Clark Bldg., Pittsburgh.

June 4-9—Society of Automotive Engineers, summer meeting, French Lick Springs Hotel, French Lick, Ind. Society headquarters are at 29 W. 39th St., New York.

June 12-16—American Electroplaters' Society in collaboration with the Electrodepositors' Technical Society of England, international electrodeposition conference, Statler Hotel, Boston. Society headquarters are at 473 York Road, Jenkintown, Pa.

June 19-23—American Society of Mechanical Engineers, semiannual meeting, Hotel Statler, St. Louis. Society headquarters are at 29 W. 39th St., New York.

Oct. 23-27—National Metal Congress & Exposition, International Amphitheater, Chicago. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.

HOW STRESSPROOF CUT COSTS on these 4 products

	SPLINED SHAFT FOR CLUTCH	WASHING MACHINE GEAR	ADJUSTING SCREW	KING PINS
STEEL REPLACED	4140	C-1117 CASE-CARBURIZED	ANNEALED A-1335 HEAT TREATED	C-1019 CASE-CARBURIZED
OPERATIONS ELIMINATED	FULL HARDENING (@ $1.25 to $3.75 PER SHAFT) STRAIGHTENING	CARBURIZING (@ $140 PER TON) FINAL CLEANUP GRIND	HEAT TREATING STRAIGHTENING	CARBURIZING SECOND PASS IN GRINDING
OTHER BENEFITS	REJECTIONS (FORMERLY UP TO 20%) REDUCED TO APPROX. ½ OF 1% MACHINABILITY UP 20%	PRODUCTION INCREASED 100%	PRODUCTION INCREASED 150% REJECTIONS PRACTICALLY ELIMINATED COSTS CUT 33%	TOTAL SAVINGS 25%

Provides 4 in 1 IN-THE-BAR QUALITIES

This unique, cold-finished carbon-steel bar cuts costs sharply because it has all four desired qualities *in-the-bar* . . . Strength . . . Machinability . . . Wearability . . . Minimum Warpage. With STRESSPROOF, no heat treating is required—its in-the-bar strength is double that of ordinary cold-finished shafting. Its machinability is 76% of B-1112—fully 50% better than heat-treated alloys of the same hardness. Its resistance to wear as machined is sufficient to replace many heat-treated or carburized steels. Being stress-relieved, it has a minimum of distortion. Investigate STRESSPROOF'S money-saving possibilities. It costs little more than ordinary cold-finished bars. Available in cold-drawn or ground and polished finishes.

Stocked by Leading Steel Warehouses

La Salle * **STRESSPROOF** ®

SEVERELY COLD-WORKED FURNACE-TREATED STEEL BARS

SEND FOR *FREE* ENGINEERING BULLETIN

"New Economies in the Use of Steel Bars"

LaSalle Steel Co.
1412 150th Street
Hammond, Indiana

Please send me your STRESSPROOF Bulletin.

Name_____

Title_____

Company_____

Address_____

City_____ State_____

*Manufacturer of the Most Complete Line of Carbon and Alloy Cold-Finished and Ground and Polished Bars in America

SHOPPING FOR BLOWERS?

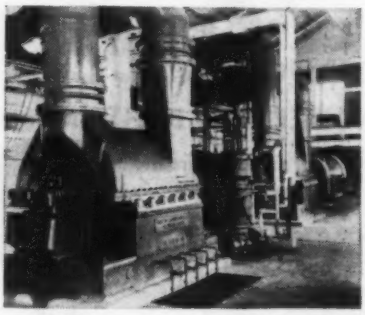
Look at *R-C dual-ability* with its wide selection to suit almost any job

Asking Roots-Connersville about blowers, exhausters and gas pumps has been standard practice among buyers for almost a century. That's because building such equipment is the only job we do. We're outstanding specialists in handling gas and air.

You'll gain from our wide varieties of sizes, types and capacities from 5 cfm to 100,000 cfm. We're the only manufacturers offering you the *dual-choice* between Centrifugal and Rotary Positive designs—and that *dual-ability* is important when it comes to matching the units to the jobs to be done.

So—when shopping, be sure to call on Roots-Connersville, the specialists. When you're interested in vacuum pumps, meters or inert gas generators, we're equally well fitted to fill these needs, too.

ROOTS-CONNERSVILLE BLOWER CORPORATION
504 Ohio Avenue, Connersville, Indiana

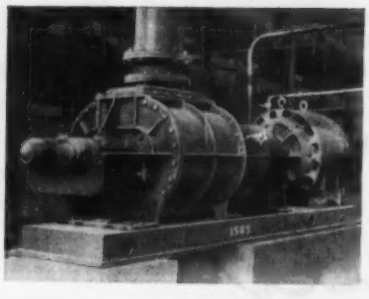


CENTRIFUGAL

Two 4-stage Centrifugal Boosters, with capacity of 27,000 cfm each, in steel mill service.

Rotary Positive Gas Pump in eastern steel mill. Capacity 3,000 cfm.

ROTARY



ROOTS-CONNERSVILLE

BLOWER BUILDERS SINCE 1854

ONE OF THE DRESSER INDUSTRIES

Pacific Northwest Business Struggling Upward at Slow Rate

Seattle — Although there has been some slight improvement in general business and industrial activity in the Pacific Northwest in the past several weeks, there is still no cause for celebration. Even jobs involving only 280 tons of track bolts, 15 tons of spikes and 10 tons of tie plate such as was recently put up for bid by the Alaska Railway, excite considerable interest and some anxiety among bidders. This job is looked upon as a sizable chunk of business percentage-wise when steel plants are operating at around 35 to 40 pct of capacity.

Winter Slows Schedule

Construction which has been under way for several months is progressing although usually behind schedule because of a severe winter and in some cases slow delivery of material. The Tacoma Narrows Bridge is behind schedule about two months because of a delay in delivery of cable but recently installation of trusses and decking was started. Cable spinning is now complete.

Another Northwest bridge is progressing rapidly with steel work on the Agate Pass Bridge started with the Puget Sound Tug & Barge Co. sandblasting and painting steel.

Delivers 55 Stratocruisers

Boeing Airplane Co. completed delivery of 55 stratocruisers in March with the last of the planes going to the British Overseas Airway Corp. filling its order for ten. Four other world airlines participated in the total.

Completion of this contract ends commercial work at the Boeing plant in Seattle, but engineers are currently doing design work on jet transports. They have released an artist's conception of three design studies of proposed jet airliners.

The construction industry in Seattle had a moderately good year in 1949 with building permits of all types totaling $53,741,845, which was below the 1948 figure of $54,461,930.

"Buffalo" Limit-Load Fan and Air Washer cleaning foundry air.

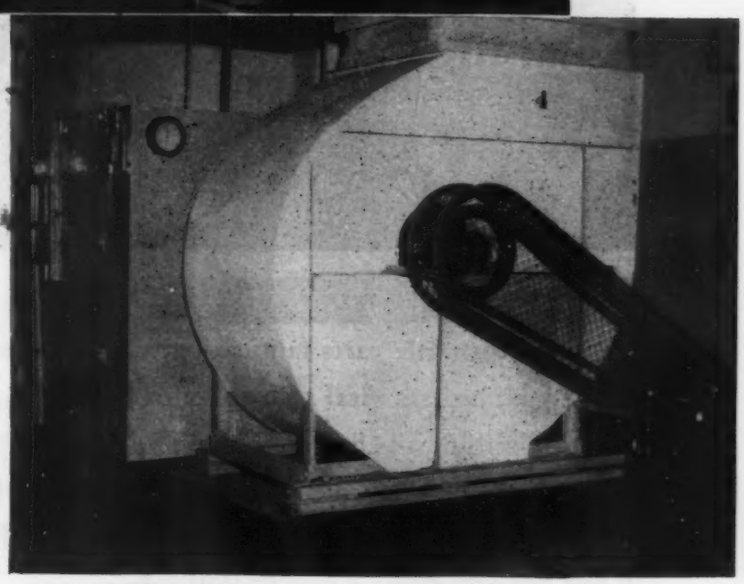
ow You Can Put Your AIR TO BEST USE

"Buffalo" AIR CONDITIONING Can Do A *Complete* Processing Job

The industrial uses of air multiply daily! It's the recognized "comfort medium" that makes workers more efficient and productive. It's a "safety factor" which can minimize explosion dangers, fume poisoning and risk of "accident-prone" workers. *It can control your product quality, your turnout—and your profits—to a remarkable degree!* And present-day "Buffalo" Air Conditioning Units can create and maintain *any* air condition you require. You can wash your air, heat or cool it as desired, control the humidity exactly, collect dust by-products from your air—easily, continuously and economically—with "Buffalo" equipment.

"Buffalo" FANS Often The Only "AIR CONDITIONING" You Need

Modern, efficient fans perform many of the functions of air conditioning. A "Buffalo" Limit-Load Fan, for instance, can "cool by ventilation"—circulating air continuously throughout the plant and causing a cool, comfortable feeling. "Buffalo" Fans can remove harmful dust, fumes and excessive moisture from your plant air. In these and dozens of other ways, "Buffalo" Fans can put your air to profitable use.



"Buffalo" "LL" Fan and Comfort Conditioning Cabinet supplying conditioned air in a large office building.

IT COSTS YOU LESS THAN YOU'D THINK

"Buffalo" equipment is permanent equipment. Flimsy, light-weight "package" units are not part of our line. The results? Many "Buffalo" air washers are still giving efficient daily service over FORTY YEARS AFTER INSTALLATION. Many "Buffalo" Fans are OVER FIFTY YEARS OLD. Here, certainly, is long-run economy! Why not talk over YOUR air and its profit possibilities with a trained "Buffalo" engineer? Write us—we'll have him call on you AT NO OBLIGATION!

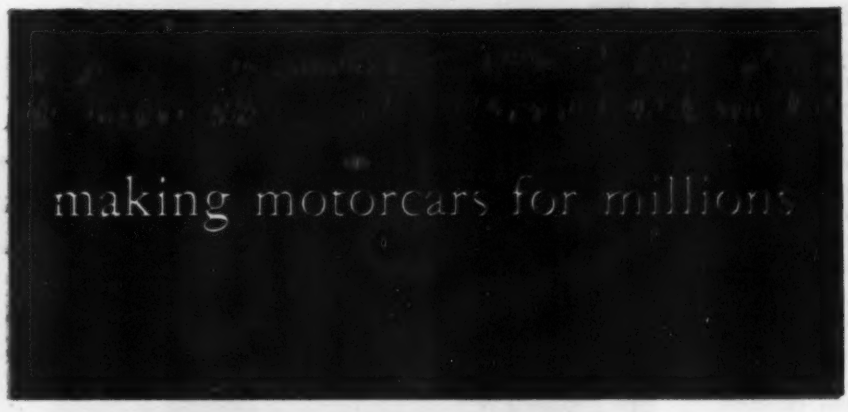
BUFFALO FORGE COMPANY

492 BROADWAY BUFFALO, N. Y.

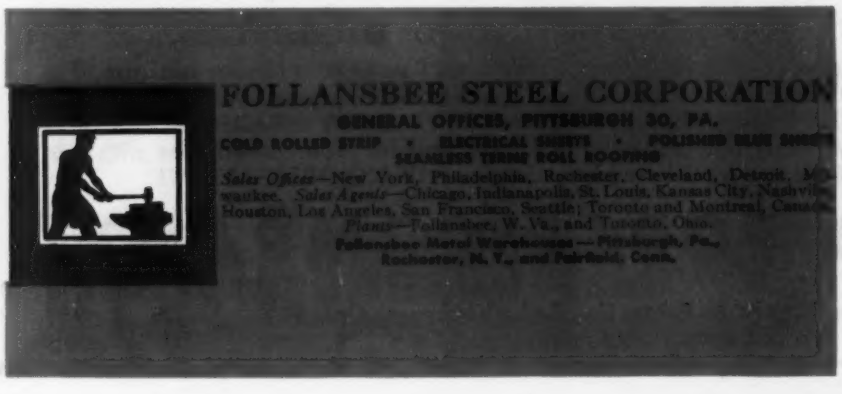
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Branch Offices in All Principal Cities

FOLLANSBEE STRIP STEEL in coils is available in a range of tempers and finishes for all types of stamping and forming operations. Follansbee Cold Rolled Strip and Follansbee Polished Blue Strip can be fed right from the coil into high-speed machines for real productioneering in



FOLLANSBEE STRIP STEEL has many potential uses in automobile parts fabrication where continuous feeding of automatics is so vital to cost-control. The machining qualities, and mill finish characteristics, of Follansbee Polished Blue Strip and Follansbee Cold Rolled Strip fit right into the pattern of precision manufacturing. Just call the Follansbee Steel Representative nearest you for full information.


FOLLANSBEE STEEL CORPORATION
GENERAL OFFICES, PITTSBURGH 30, PA.
COLD ROLLED STRIP • ELECTRICAL SHEETS • POLISHED BLUE SHEETS
SEAMLESS TERNE ROLL ROOFING
Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. Sales Agents—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada.
Plants—Follansbee, W. Va., and Toronto, Ohio.
Follansbee Metal Warehouses—Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn.

Normal Volume of Sales Reported by Borg-Warner Corp.

Chicago — Sales of the Borg-Warner Corp. returned to normal volume in 1949, with net income equal to $22 million. This represents a decline from the boom year of 1948, but is higher than had been anticipated, the company's annual report stated.

The management is optimistic about the future of the automobile transmission division of the company, and also reports heavy demand for the company's products in other industries. Sales took an upturn in March.

Galvanizers Committee to Meet

New York—The spring meeting of the Galvanizers Committee, sponsored by the American Zinc Institute, will be held at the King Edward Hotel, Toronto, May 18 and 19.

Included on the schedule for the two-day event will be round table discussions of equipment and materials, presentation of the committee's first annual award to Tadeusz Sendzimir, vice-president of Armzen Co., for fundamental achievements in the art of galvanizing sheets, and an inspection tour of the operations of the Lysaght Dominion Sheet Metal Corp., Ltd., and the Steel Co. of Canada, Ltd., in Hamilton, Ontario.

Thompson Earns Record Profits

Cleveland—Increased shipments to aircraft customers were responsible for the gain in sales during 1949 over 1948 of Thompson Products Inc., according to F. C. Crawford, president of the company. Sales to manufacturers of automotive, marine and industrial products were about the same while replacement parts sales to automotive jobbers declined.

In a report to stockholders Mr. Crawford announced net sales of $107,608,803 for 1949, a new peacetime record, and net profits of $6,014,748, the highest in the company's history.

Lindemann

SPECIAL SCRAP BALER FOR STEEL WORKS
PRODUCING HEAVY BALES UP TO 5000 LBS
REDUCE BALING COSTS, CHARGING TIME AND MELTING HOURS.
INCREASE CAPACITY OF CHARGING BOXES OR PEELS, STEEL OUTPUT AND PROFIT

LINDEMANN • PRESSENBAU G.M.B.H. • DUSSELDORF GERMANY

US-AGENTS: FORAM CORPORATION, 76 BEAVER ST., NEW YORK 5. MANUFACTURER'S EXPERT IS NOW IN THE STATES.

Order from your

JOHNSON DISTRIBUTOR

NEARLY every industrial requirement for sleeve bearings can be supplied from stock . . . at low cost. These Johnson Bronze Bearings and metals are available at your distributor. For complete size range, write today for the new Johnson Bronze Catalog.

Babbitt

• Lead-base Babbitt for general industrial requirements and Tin-base Babbitt for high speed applications. Cast to be easily broken into one-pound sections. High quality made to SAE specifications.

Universal Bronze

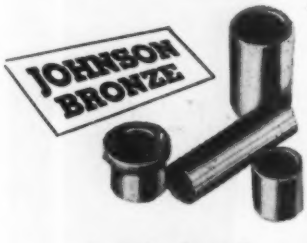
• Over 350 stock sizes, completely machined, solid and cored bars. Solid bars from ⅜" to 4" diameters, cored bars from ½" to 7¾" inside diameters. 1" to 10" outside diameters.

General Purpose Bearings

• Over 850 sizes of Johnson GP Bearings are available from stock. Each bearing is guaranteed to be consistent in alloy, correct in tolerance, and of high quality workmanship.

Graphited Bearings

• Over 200 sizes of Johnson Cast Bronze Graphited Bearings. Dovetail grooves provide 40 to 45% graphite contact with the shaft. Johnson Bronze is the only manufacturer who stocks this type bearing.



Ledaloyl *Self-Lubricating* Bearings

• Produced by powder metallurgy. Johnson Ledaloyl Bearings are made of pre-alloyed metals. Porous structure retains lubricant. Industry is constantly finding new uses for Ledaloyl Bearings.

Electric Motor Bearings

• Over 300 individual bearings designed specifically for all popular motors. Johnson EM Bearings are fully machined, with oil grooves, oil holes and slots, correct in tolerance, ready for immediate installation.

Johnson Bronze

SLEEVE BEARING HEADQUARTERS

505 SOUTH MILL STREET . NEW CASTLE, PA.

Symposium on Non-Destructive Testing Set for ASTM Conclave

New York—A symposium to acquaint engineers and management with the advantages and uses of non-destructive testing will be held June 27 at Atlantic City during the annual meeting of the American Society for Testing Materials.

Sponsored by ASTM Committee on Non-Destructive Testing, the theme of the one-day conference is to be "The Role of Non-Destructive Testing in the Economics of Production."

Papers by leading authorities in the field will survey the wide range of application of all the non-destructive testing and inspection methods and will show how proper use of them can reduce production costs and improve product quality. The testing methods that will be covered include radiography, ultrasonics, magnetic particle and liquid penetrant inspection and magnetic analysis.

Chairman of the symposium will be H. H. Lester, of Watertown Arsenal. The speakers will include R. C. McMaster, Battelle Memorial Institute; Kent R. Van Horn, Aluminum Co. of America; J. Juppenlatz, Lebanon Steel Foundry; W. L. Schwinn, Babcock & Wilcox Co.; C. D. Moriarty, General Electric Co.; and L. W. Ball, U. S. Naval Ordnance Laboratory.

Develop New Classifying System

Cleveland—A new system for classifying metallurgical information, designed to serve librarians and metallurgists, has been developed by American Soc. for Metals in cooperation with the Special Libraries Assoc., ASM headquarters here announced.

Metallurgical information in all printed or recorded forms can be easily found and classified as to processes, properties and materials, the announcement stated. When used with a special punch-card system, the system provides for as many as 181,000 different index headings.

Licensing English Firm Seen Method to Hold World Leadership

Mount Vernon, Ohio—A step to pierce trade barriers thrown about dollar-short countries and continue leadership of American engine and compressor units was taken recently by the Cooper-Bessemer Corp. It licensed Harland and Wolff, Ltd., British shipbuilder and engine manufacturer, to build and install its angle type compressors in specified sterling area countries.

Cooper-Bessemer type JM motor-driven units, the angle type gas engine-driven units, and others will be built by the English firm, which will make royalty payments in dollars, reported Gordon Lefevre, president of Cooper-Bessemer. The American company will continue to sell to firms within the Harland and Wolff bailiwick if purchases are contracted for in America.

Now studying Cooper-Bessemer designs and manufacturing processes are personnel of the English company. Tooling and production of GMV-6 compressor units already on order for Trinidad will start immediately.

Iron, Steel Payroll Listed

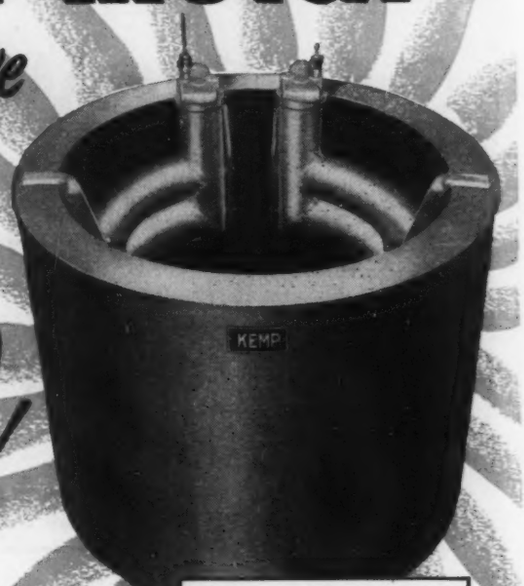
New York—The January iron and steel industry payroll of $189,346,000 topped all months since April 1949. It was $202,057,000 in January '49 and $184,750,000 last December, reported the American Iron and Steel Institute.

Average hourly payments in January were $1.72 for a 38.5-hour average week. Total employment was 609,400, highest since last July. The statistics were obtained from 114 companies, representing 93 pct of industrial capacity.

Predicts Record Car Sales

Detroit — Registration of new automobiles in the first three months of 1950 may be record-making, R. L. Polk & Co., Detroit statisticians for the industry revealed.

melt metal and save up to 40% on fuel!



Kemp Immersion Pots are available in all sizes. Shown here is a 44" Pot. Capacity: 10,000 lbs., casting rate: two tons per hour!

How immersion heating, developed by KEMP, assures low fuel costs and faster heating for both large and small melting units.

For maximum economy in melting soft metals, lead, pewter, tin or salt—install modern Kemp Immersion Heating! Actual cases prove that Kemp Immersion Heating cuts fuel bills up to 40% and more. Provides rapid heat recovery in ⅓ the time . . . assures the high thermal efficiency for both large and small units!

POSITIVE HEAT CONTROL

Replace conventional heating or melting equipment with modern, efficient Kemp Immersion Pots and *save money*. There's no brickwork to steal heat . . . no external combustion chamber . . . no carbon monoxide . . . no temperature overrun. You get *high melting rates*, reduced dross formation, speed of temperature recovery after adding cold materials . . . PLUS an estimated fuel saving of up to 40% and more!

SEND FOR DETAILS

The Kemp Carburetor, part of each installation, assures complete combustion with no waste. One-pipe air and fuel feed reduces installation costs, simplifies maintenance. Get the facts. Find out how much you can save. Fill out and mail coupon for Bulletin IE-11 today!

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Now you can get Grinding Wheels— especially made for your work— at no greater cost and without delay!

- BETTER FINISH
- EASIER CUTTING
- LONGER WHEEL LIFE
- REDUCED GRINDING COST

The factors listed at the right all enter into determining the *best* grinding wheel or disc for each job. Figure the odds in favor of custom-made wheels over stock grades in meeting these specific job requirements . . . and giving you better work at lower cost.

Besly-Titan is set up to produce grinding wheels and discs to *individual job specifications* at no more than you'd pay for ordinary stock wheels—and delivers in a few days! What's more, Besly-Titan field engineers work with you on the specifications. We'll *prove* the savings and work improvement you can gain from wheels and discs especially made for *your* work.

We're doing this for many large companies. We can do it for you. Write us.

BESLY TITAN

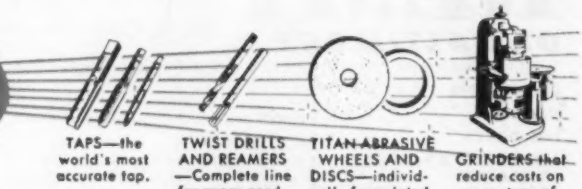
Engineers check for these variable conditions — and recommend Custom-Made Wheels to meet them exactly:

Kind of Material
Amount of Stock Removal
Reliefs in Grind
Degree of Finish
Tolerances (flatness, parallelism, size)
Model of Grinder and Condition
Wet or Dry Grinding
Speeds of Work and Spindle
Fixtures or Free Hand Grinding

Write for FREE CATALOG

Lists all types and sizes of wheels and discs.

BESLY



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TWIST DRILLS AND REAMERS —Complete line for every need.

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GRINDERS that reduce costs on every type of surface grinding.

CHARLES H. BESLY & COMPANY

122 N. Clinton Street • Chicago 6, Illinois
Factory: Beloit, Wisconsin

American Industry Plans Cut in Improvement Spending

Washington — American industry this year will cut its spending for plants and new equipment by $2 billion or 11 pct, according to the latest joint survey by the Commerce Dept. and the Securities & Exchange Commission.

Capital outlay for plants and equipment during 1950 is estimated at $16.1 billion as compared with $18.1 billion last year. Such expenditures totaled $19.2 billion during the peak year 1948.

Each major industry group, including public utilities, is planning lower capital outlays. Most drastic of the planned reductions involves the railroads which will cut their outlay by a third—from $1,350 millions in 1949 to $930 millions in 1950.

A major portion of the decline is seen as taking place during the last half of 1950.

Enters Vacuum Metallizing Field

Philadelphia—The F. J. Stokes Machine Co. has announced its entry into the field of vacuum metallizing with complete equipment for the metal coating of such products as plastics, crystals, glass, paper and textiles.

The company will furnish complete-package installations consisting of vacuum chambers, vacuum pumping units, product mounting assemblies and vacuum instrumentation.

Directors Approve Pension Plan

Chicago—A company-wide pension plan, which provides $100 a month minimum, for the more than 8000 employees of Fairbanks, Morse & Co. has been approved by the directors, it was announced by Robert H. Morse, Jr., president.

The plan will be offered to the office and sales personnel when government approval is granted. The company will hold collective bargaining talks to work out the pension plan for employees represented by unions.

Over the Long Haul

The FERRY CAP Spring Bolt *Proves its Mettle*

This Ferry Cap Spring Bolt is one of hundreds of different designs which we make for leading truck manufacturers. We manufacture them to various head shapes, with oil holes and grooves of different kinds, and flats accurately milled. Precision is a principle at Ferry Cap.

The bolt has maximum ground surface-wearing qualities. It is case hardened to proper depth, achieving a hard surface with a relatively soft core, assuring both long wear and high fatigue strength. The thread end is annealed to make it tough, but not brittle—more than equal to the required thread strength.

The body is ground to close tolerance, oil holes expertly drilled, and flats milled to a smooth, true surface to allow free flow of lubricants. The cotter holes, accurately drilled, are free from burrs. Result—the bolt fits perfectly.

It is a spring bolt of which any truck manufacturer can well be proud—a clean cut, precision-made, long-wearing, tough, dependable product.

The FERRY CAP & SET SCREW Co.

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CAP AND SET SCREWS • CONNECTING ROD BOLTS • MAIN BEARING BOLTS • SPRING BOLTS AND SHACKLE BOLTS • HARDENED AND GROUND BOLTS • SPECIAL ALLOY STEEL SCREWS • VALVE TAPPET ADJUSTING SCREWS • AIRCRAFT ENGINE STUDS • ALLOY STEEL AND COMMERCIAL STUDS • FERRY PATENTED ACORN NUTS

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If you want better blast cleaning, switch to Certified, the high-quality abrasive. Certified's Samson Shot and Angular Grit are modern abrasives, produced by a special, automatically-controlled hardening process that makes each abrasive particle a homogenous mass. Thus Certified wears slowly, can be used over and over again.

With Certified in your plant, castings are cleaned in a jiffy. Scale, rust and dirt disappear completely, giving you more efficient blast cleaning. Find out for yourself how Certified's higher quality pays off in the cleaning room. Order Certified Abrasives today and get better blast cleaning!

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PITTSBURGH, PENNA.

STEEL SHOT AND GRIT CO.
BOSTON, MASS.

Raise Imports, Cut Exports Hoffman Asks for Marshall Plan

Washington—The United States must accelerate imports from Western Europe and curb exports if the Marshall Plan is to succeed during the next 2 years, Paul Hoffman, chief of the Economic Cooperation Administration, warned this week.

He said that Marshall Plan countries must build up economic sources of supply in Europe and in other non-dollar areas and increase their dollar earnings with shipments to America.

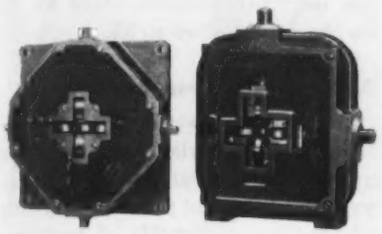
Hoffman reported that the first 2 years of Marshall aid have seen industrial production in ECA countries rise 15 pct above the 1938 level. Specifically, he said, the 1949 steel output of 46 million metric tons was 17 pct greater than in 1948; textile yarns production was 15 pct over the 1948 figure, coal, up from 398 million metric tons to 434 million metric tons, electricity production, up from 13,614 million kwh in 1947 to 16,500 million kwh in 1949, and motor vehicles, up 50 pct from 1948.

Over-all employment continues high, with the labor force fully employed in all Western European countries except Italy, Western Germany, Belgium, and Greece, Hoffman reported.

"The little woman always puts me up a good lunch."

METAL FORMING NEWS

Turks Heads Do Away With Costly Delivery Delays



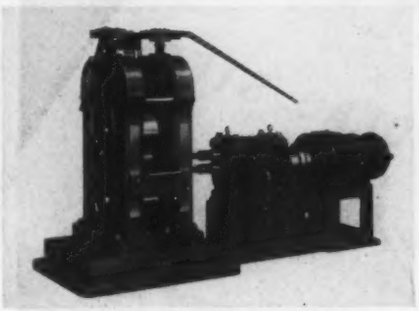
SHAPE WIRE QUICKLY . . . accurately . . . economically with Turks Heads.

With a Turks Head and wire flattening mill in tandem, manufacturers can produce their own key stock. No need to wait 8 to 10 weeks on deliveries.

Turks Heads do away with draw dies, form rod and wire to square, rectangular, keystone, diamond or special shapes. They are highly accurate, take a greater reduction per pass and use less power than other methods of shaping metals.

With the universal Turks Head, square and rectangular shapes may be produced in varying dimensions by simple roll adjustment thereby eliminating costly inventory of multiple die sizes.

Precision Four-High Heavy Duty Mills Finish Sheets Accurately To A Thin Gauge



FENN FOUR-HIGH HEAVY DUTY MILL above has work rolls 5⅜" diameter and backing rolls 14" diameter.

The Fenn Four-High Heavy Duty Mills win considerable comment for outstanding efficiency wherever they are operated. These mills are used largely in finishing sheets of all types of alloys, ferrous, and non-ferrous.

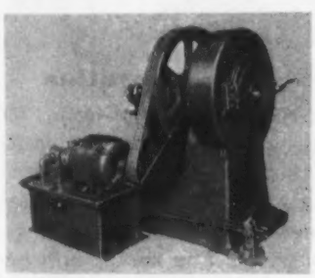
The secret of their outstanding performance is the small diameter of the two working rolls and the extreme accuracy which our craftsmen build into the mills. Because of the small diameter work roll, a larger reduction can be made per pass with less work hardening. The heavy backing rolls together with Fenn's precision workmanship insure accurate gauges and extremely small tolerances. Working roll sizes range from 1½" diameter and 3" face width to 7" diameter and 16" face width.

A convenient feature of these mills is that they can be arranged either in tandem or as a single stand. Where the type of operation cannot economically permit the use of tandem mills, a reversing drive will allow a single mill to do the job and is a welcome plus. These mills can be furnished with single handwheel manual screwdown or electrical screwdown for roll adjustments.

Through these Fenn mills, manufacturers can rely on consistently good results in sheet-flattening. Single, reversible action mills are available for small quantities, tandem units are available for large-scale production.

EDUCATIONAL FILM EXPLAINS BENEFITS OF SWAGING

See how swaging improves physical characteristics of metal — permits improved grain structure, tensile strength, elasticity. A 16 mm. 26-minute sound motion picture is available free on request. For film, just write The Fenn Manufacturing Company direct.



FENN HYDRO-FORMER saves time, metal, labor. Simple to use, needs no highly skilled operator.

Unique Hydro-Former Opens New Fields For Metal-Saving Swaging

A patented hydraulic principle of wedge opening of dies is the secret back of the unique Fenn Hydro-Former performance which permits swaging at any cross section of the piece.

Ball type fittings that cannot be swaged on ordinary rotary swagers can now be swaged on this remarkable machine. In one operation, the Fenn Hydro-Former connects tubings or cables to solid fittings with joints equivalent to welds or rivets in strength. Comes in three sizes.

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1845 Broad Street
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Shaping metal for better and stronger products at lower cost

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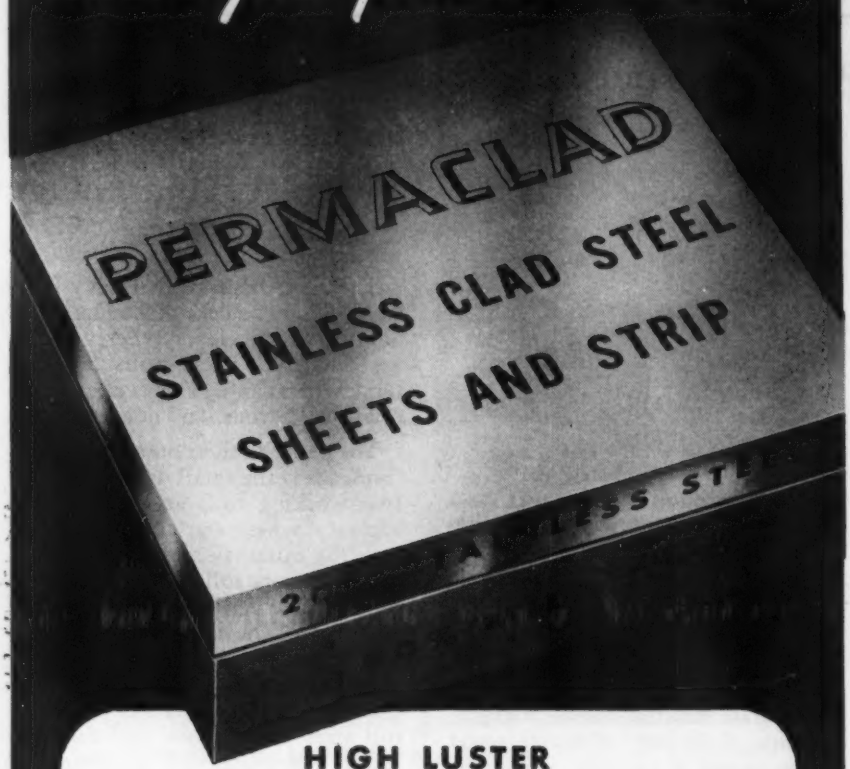
STAINLESS PROTECTION

where your product needs it



HIGH LUSTER CORROSION RESISTANT PRODUCTS . . . AT LOW COST

Fabricate with PERMACLAD STAINLESS CLAD STEEL and you give your products stainless protection and beauty at greatly reduced cost . . . and at the same time you trim your forming expense.

PERMACLAD combines the surface characteristics of stainless steel with the excellent forming qualities of carbon steel, thus providing corrosion resistance at decreased costs. You can cold form PERMACLAD easily . . . deep-draw it without intermediate annealing and form it into parts that cannot be formed at all from other corrosion resistant materials.

The percentage of cladding (10% or 20%), remains constant even with the most severe draw.

Now is the time to cut costs and produce more attractive, higher quality products . . . architectural trim, interiors, exteriors, etc. Get complete information today. Write for FREE 8-Page Folder P-19.

The Finer The Finish, The Finer The Product Use PERMACLAD

PERMACLAD STAINLESS CLAD STEEL

FREE

PUBLICATIONS

Continued from Page 34

tions are given. *Janette Mfg. Co. For more information, check No.* 12 *on the postcard on p.* 35.

Acetylene Generators

Stationary acetylene generators that supply acetylene at a pressure up to 13 psi, designed for use in welding shops and production plants where a large quantity of acetylene is needed are featured in bulletin. *Sight Feed Generator Co. For more information, check No.* 13 *on the postcard on p.* 35.

Heavy Duty Mounts

Vibration and noise control by use of specially designed, heavy duty mounts for fans, compressors, pumps, engine-generator sets, instrument panels, and accessory equipment is described in catalog sheet. Construction features and applications are included. *Korfund Co., Inc. For more information, check No.* 14 *on the postcard on p.* 35.

Liquid-Gas Separation

The redesigned Liqui-jector, for use in precison pneumatic operations that require positive conditioning of air or gas, is described in a new 4-p. folder. *Selas Corp. of America. For more information, check No.* 15 *on the postcard on p.* 35.

Fire Hazards

Pocket-sized, 36-p. Fire Hazard Index lists over 590 chemical, gas and common fire hazards, specifies which type of fire-fighting equipment to use on each, and contains basic facts about fire-fighting. *Randolph Laboratories, Inc. For more information, check No.* 16 *on the postcard on p.* 35.

Electric Hoist

List prices, specifications and dimensional data for Load King chain and lug type electric hoists

no waiting

If you need specialty steel right away . . . and a mill shipment is too slow . . . or your order not big enough for a mill order . . . check with Crucible. Crucible maintains 23 warehouses and pools conveniently located . . . and completely stocked to meet your requirements. Let Crucible's immediate delivery lighten your inventory load.

There's no need to wonder whether your steel needs will be met on time when the Crucible warehouse nearest you is so well prepared to serve you. Come in and see for yourself. And take full advantage of Crucible's alert metallurgical service . . . it's freely available to you. CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, New York.

Complete stocks maintained of
High Speed Steel . . . AISI Alloy, Machinery, Onyx Spring and Special Purpose Steels . . . ALL grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits and Hollow Drill Steel) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes)

CRUCIBLE first name in special purpose steels

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FORT PITT BRIDGE

when dependable service and good workmanship are important

CUSTOMER SERVICE, integrity and the fulfillment of contract promises and agreements—has built an enviable reputation for the FORT PITT BRIDGE organization over more than 53 years. May we serve you on your next project?

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FREE PUBLICATIONS

Continued

and accessory equipment are given on a 2-p. data sheet. *Yale & Towne Mfg. Co. For more information, check No.* 17 *on the postcard on p.* 35.

Centralized Lubrication

A lubrication system that provides centralized lubrication for all bearing points on machinery requiring periodic applications of oils is described in bulletin. Every bearing receives the right quantity of lubricant at the right time. *Lincoln Engineering Co. For more information, check No.* 18 *on the postcard on p.* 35.

Material Handling

Use of power industrial trucks in the world's largest one-story warehouse for general consumer merchandise is described in a 4-p. illustrated folder. *Elwell-Parker Electric Co. For more information, check No.* 19 *on the postcard on p.* 35.

Hydraulic Presses

Use of hydraulic presses for sheet metal working industries, and features of the Birdsboro hydraulic presses are given in a new 28-p. bulletin also containing a guide to selection of appropriate size and type of press. *Birdsboro Steel Foundry & Machine Co. For more information, check No.* 20 *on the postcard on p.* 35.

Lubricating Oil

A new light-colored, carbon-free high temperature lubricating oil, known as Safco No. 1250 Hi-Temp oil, is described on a product data sheet. *Swan-Finch Oil Corp. For more information, check No.* 21 *on the postcard on p.* 35.

Tool Crib Control

How to figure the return on an investment in McCaskey Tool Crib Control is explained in a new 4-p. pamphlet presenting facts gained from 30 years of practical experience in every type of plant. *McCaskey Register Co. For more information, check No.* 22 *on the postcard on p.* 35.

Resume Your Reading on Page 35

MARKET

Briefs and Bulletins

deep, dark secrets — Secretary of Interior Oscar Chapman will "bare" the "monopolistic trends in the acquisition of raw materials by steel companies" to open Washington's house committee investigation of "monopoly trends in the steel industry" next week, reports Rep. Celler, D., N. Y., committee chairman. Other witnesses to testify next week include James Boyd, Bureau of Mines chief; H. B. McCoy, head of the Commerce Dept.'s Office of Domestic Commerce; and Prof. George Stigler, of Columbia University. Rep. Celler states that he has invited representatives of steel companies to take the witness stand during the week of Apr. 24.

not up to snuff—March domestic freight car deliveries were 1712 as compared with 2046 in February and 11,190 in March, 1949, announces the American Railway Car Institute. Orders placed in March totaled 6201, of which 2271 went to the car builders and 3930 to railroad shops. Of March deliveries 830 came from car builders and 882 from railroad shops. Production on leading types of cars was: box 169, hopper 293, flat 916, gondola 210, refrigerator 32, and tank 87. As of Apr. 1 the order backlog was: car builders, 12,104; railroad shops, 18,435.

up but down—Although the steel industry employed 4000 more workers in February over January, the total payroll slumped because February was a short month, reports the American Iron and Steel Institute. Wage earners producing and marketing iron and steel in 114 companies, or 93 pct of capacity, worked an average 38.8 hrs a week as compared with 38.5 hrs in January. Hourly earnings averaged $1.704 in February, against $1.720 in January.

cuts in the offing—A third round of postwar tariff cuts is in the offing. Discussion of more reciprocal trade agreements will take place in Torquay, England, starting on Sept. 28 among representatives of the United States and 25 other acceding nations. Indonesia and Greece will attend for the first time. The State Dept. hints that from three to nine governments will see the light and join the movement.

fingers crossed—With business still booming, appliance manufacturers have their fingers crossed over the removal of government credit regulations. There is no longer a Regulation W to lift if business lags again. Observers are jittery that customers may be over their heads in purchasing.

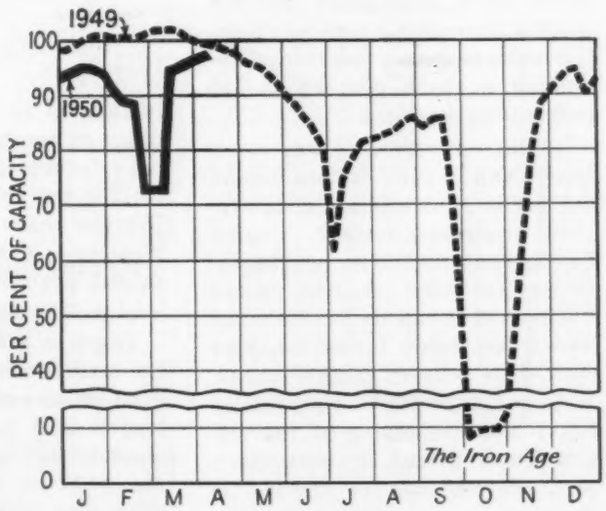
not needed—Inspired by a scrap shortage afflicting America and Canada, restrictions on the import of cast iron and steel scrap into Canada were lifted. Export of scrap iron and steel from Canada will continue under export permit. The restrictions were created at the request of the U. S. government to move limited tonnages of metal into Canada during the shortage period.

revised listing—Inland Steel Co. has issued a revised list of extras on hot rolled strip. Principal revisions cover separate size extra tables for cut edge and mill edge and a reduction in the extra charge for exclusion of random shorts from 10 pct to 25¢ per 100 lbs.

repercussions—Domestic market tin buying has been very light since March when the Reconstruction Finance Corp. unloaded 2900 tons into the market. In the meantime buyers are working down their high-priced inventories while expecting further reductions in the market.

coke shortage—An oven coke shortage in the Pittsburgh area has forced foundries there and in parts of the South to pay freight for long-distance shipments from the East.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
April 2	101.5*	102.0*	89.5	94.0	98.0*	104.0	104.0	104.0	106.0*	98.0*	87.0	88.9	98.6	97.0
April 9	100.0	100.0	89.5	94.0	98.5	104.0	104.0	104.0	103.0	95.5	87.0	84.3	119.0	98.0

* Revised.

Nonferrous Metals OUTLOOK

Market Activities

by John Anthony

Demand for metals surges upward . . . Consumer activity reaching peak levels . . . Price advance forecast for zinc . . . Lead buying more active . . . Scrap prices higher

New York—There was increasing strength in the metal markets last week, as buyers began to bank heavily on continued good business and the expectation of lower metals prices started to fade. Brass mills, wire mills and die casters were doing peak business. Galvanizers were going strong, including a sharp pick up in job galvanizing business.

Buying of metals was very heavy, and in some metals beyond the needs of immediate consumption, producers suspect. Copper buying continued to be very heavy. Orders are being taken for all the business that can be handled, and buyers are being turned away or shifted to delivery further ahead. May and June will be especially heavy months judging by the volume being placed in some quarters. Foreign copper demand is growing.

Zinc Buying Presses Producers

The zinc market is pushing the capacity of producers, some of whom are still suffering from the reduced supply of ore caused by the mine and smelter closedowns when the market was on the downgrade. The strength of the market is such as to indicate the probability of another price rise in the near future. Special High Grade is still the most difficult to get. But the heavy demand for Prime Western is pushing it into a close second position. Brass mills are buying zinc actively.

There is a firmer undertone in the lead market. Buying is being done on an orderly basis. Foreign lead is still being offered on the market. But reports indicate that the price is ¼¢ higher than a week ago. Imports in February were reported at 31,000 tons, which is close to half of the normal monthly consumption rate. Imports come in a shipload at a time, so there is every probability that additional shipments from Yugoslavia, Japan or Germany may be expected to burden the market again. Imports from Mexico have increased due to the lower rate of European consumption. But Mexican and Canadian lead is not generally sold below the domestic market.

Scrap Prices Advance

The scrap market reflects the better demand for metals. Refineries and ingot makers have advanced copper and brass scrap buying prices by ¼¢ per lb. In the case of copper, the advance is reported to hold for large lots only. The market is short of these grades, and with the low rate of activity dealers are feeling their increased costs. Lead scrap buying prices were also raised last week.

The aluminum ingot market has improved appreciably and prevailing prices are slightly higher. Aluminum scrap buying prices are also higher.

NONFERROUS METALS PRICES

	Apr. 5	Apr. 6	Apr. 7	Apr. 8	Apr. 10	Apr. 11
Copper, electro, Conn.	18.50	18.50	18.50	18.50	18.50	18.50
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625	18.625
Tin, Straits, New York	75.375	76.00	76.00	....	76.00	*76.125
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	10.30	10.30	10.30	10.30	10.30	10.30

Note: Quotations are going prices.
* Tentative.

MILL PRODUCTS

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25 36.7¢ to $1.05; 35 to 37, 44¢ to $1.53; 47 to 49, 63.5¢ to $2.20.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 24¢ to 30.5¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 26.5¢ to 32¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4; ⅛ to 11/32 in., 49¢ to 38¢; ⅜ to 1½ in., 27.5¢ to 35.5¢; 1 9/16 to 3 in., 35.5¢ to 32.5¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T-6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher. Base: Up to ¾ in. diam., 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher. Base: Up to ¾ in. diam, 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢ 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and bars	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	..	40

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	32.18	....	31.78
Copper, h-r	....	28.03	....
Copper, drawn	....	29.28	....
Low brass	30.12	29.81	33.03*
Yellow brass	28.69	28.38	31.70*
Red brass	30.60	30.29	33.51*
Naval brass	33.51	27.57	28.82
Leaded brass	....	33.19	27.22
Com'l bronze	31.61	31.30	34.27*
Manganese bronze	37.01	30.92	32.42
Phosphor bronze	50.90	51.15	....
Muntz metal	31.58	27.14	28.39
Everdur, Herculoy, Olympic, etc.	37.19	36.14	....
Nickel silver, 10 pct	39.66	41.87	46.80
Arch. bronze	....	....	27.22

*Seamless tubing.

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	24.50
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$52.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	18.50
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $110
Lead, St. Louis	10.30
Lead, New York	10.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, 100 to 5000 lb	36¢ to 38¢
Mercury, dollars per 76-lb flask f.o.b. New York	$70 to $73
Nickel, electro, f.o.b. New York	42.97
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	36.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$66 to $69
Silver, New York, cents per oz.	71.75
Tin, New York	76.125
Zinc, East St. Louis	10.50
Zinc, New York	11.22
Zirconium copper, 10-12 pct Zr, per lb contained Zr	$12.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	17.25-18.25
No. 120	16.75-17.75
No. 123	16.25-17.25
80-10-10 ingot	
No. 305	21.75
No. 315	19.75
88-10-2 ingot	
No. 210	27.75
No. 215	25.25
No. 245	18.75-21.00
Yellow ingot	
No. 405	14.50-16.00
Manganese bronze	
No. 421	20.75

Aluminum Ingot

(Cents per lb, lot of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.25-18.75
0.60 copper, max.	18.00-18.50
Piston alloys (No. 122 type)	16.50-17.00
No. 12 alum. (No. 2 grade)	15.75-16.25
108 alloy	16.50-17.00
195 alloy	17.25-17.75
13 alloy	18.25-18.75
AXS-679	16.75-17.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	17.50-18.00
Grade 2—92-95%	16.50-17.00
Grade 3—90-92%	15.50-16.00
Grade 4—85-90%	15.00-15.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	35⅛
Electrodeposited	29⅝
Rolled, oval, straight, delivered	33
Forged ball anodes	34
Brass, 80-20	
Cast, oval, 15 in. or longer	31
Zinc, oval, 99.886, f.o.b. Detroit	17¼
Ball anodes	16¼
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	48½
Copper sulfate, 99.5 crystals, bbl	12.00
Nickel salts, single or double, 4-100 lb bags, frt allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz lots, per oz.	61¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, 89 pct granular	7.15
Zinc cyanide, 100 lb drums	38.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	15½	14¾
Yellow brass	12½	11⅝
Red brass	14	13¼
Commercial bronze	14¼	13½
Manganese bronze	12	11¼
Leaded brass rod ends	12¼	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	15.25-15.50
No. 2 copper wire	14.25-14.50
Light copper	13.25-13.50
Refinery brass	14.00*
Radiators	10.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	15.25-15.50
No. 2 copper wire	14.25-14.50
Light copper	13.25-13.50
No. 1 composition	12.75
No. 1 comp. turnings	12.25
Rolled brass	10.50
Brass pipe	11.00
Radiators	10.00-10.25
Heavy yellow brass	9.75-10.00
Aluminum	
Mixed old cast	9.25- 9.50
Mixed old clips	10.25-10.50
Mixed turnings, dry	9.50
Pots and pans	9.75
Low copper	11.00-11.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	14 —14¼
No. 2 heavy copper and wire	13 —13¼
Light copper	11¾—12
Auto radiators (unsweated)	8¾— 9
No. 1 composition	11¼—11½
No. 1 composition turnings	10¾—11
Clean red car boxes	9¼— 9½
Cocks and faucets	9¼— 9½
Mixed heavy yellow brass	7½— 7¾
Old rolled brass	8¾— 9
Brass pipe	9½— 9¾
New soft brass clippings	10½—11
Brass rod ends	9¾—10
No. 1 brass rod turnings	9½— 9¾
Aluminum	
Alum. pistons and struts	4½— 5
Aluminum crankcases	7 — 7½
2S aluminum clippings	10 —10½
Old sheet and utensils	7 — 7⅛
Borings and turnings	4
Misc. cast aluminum	7 — 7½
Dural clips (24S)	7 — 7½
Zinc	
New zinc clippings	6¾— 7¼
Old zinc	4½— 5
Zinc routings	2¾— 3¼
Old die cast scrap	3½— 3¾
Nickel and Monel	
Pure nickel clippings	21 —23
Clean nickel turnings	14 —15
Nickel anodes	20 —22
Nickel rod ends	20 —22
New Monel clippings	12 —14
Clean Monel turnings	8 — 9
Old sheet Monel	10 —12
Old Monel castings	9 —10
Inconel clippings	11 —13
Nickel silver clippings, mixed	8 —10
Nickel silver turnings, mixed	6 — 7
Lead	
Soft scrap, lead	8¼— 8½
Battery plates (dry)	4¼— 4½
Magnesium	
Segregated solids	9 —10
Castings	5½— 6¼
Miscellaneous	
Block tin	60 —62
No. 1 pewter	38 —40
No. 1 auto babbitt	35 —37
Mixed common babbitt	8¼— 8½
Solder joints	11 —11⅜
Siphon tops	40 —42
Small foundry type	11 —11½
Monotype	10 —10½
Lino. and stereotype	9¼— 9¾
Electrotype	8¼— 8½
New type shell cuttings	11¾—12
Hand picked type shells	4½— 5
Lino. and stereo. dross	3⅝— 4
Electro. dross	2¼— 2⅛

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

Railroad Grades Move Up; Cast is Firmer

Higher prices on railroad steel and cast iron grades featured the market during the past week. Railroad No. 1 heavy melting steel was up $1.50 a ton at Birmingham and Pittsburgh. It was $1.00 a ton higher in Cleveland. Railroad specialties were generally stronger too.

Showing a pickup in foundry business, the cast market was stronger in almost every district though not all reported sales at higher prices. Mixed yard cast was $1.00 a ton higher at Pittsburgh and Philadelphia. Machinery cast was up by the same amount at Chicago and Cleveland.

This week the market had all the earmarks of a minor battle between buyers and sellers, with the former trying to hold out to keep things from going too high. One factor that could upset the quiet buying practices of the mills in recent months is the increase in purchases for conversion deals.

PITTSBURGH—The market undertone continued strong, but in the absence of mill buying, the price of No. 1 heavy melting remained unchanged at $33.00, top. The turnings market was tight, and machine shop turnings rose 50¢ to $23.50. Low phos was $1.00 higher; heavy turnings were up $1.00 on a sale. Higher prices were paid for the railroad lists, advancing No. 1 railroad heavy melting $1.50 to $35.00, while scrap rails and specialties were up 50¢. Mixed yard cast was up $1.00 a ton.

CHICAGO—Scrap prices in the Chicago area retained the firmness of the last week with little change in prices. Mill buying has not been active and most of the business consisted of filling back mill orders. A large mill rejected quantities of No. 2 dealers bundles because the quality did not meet specifications. Good quality scrap is hard to come by. Improved foundry business brought the price of No. 1 machinery cast up $1.00 a ton to a top of $42.00 per gross ton.

PHILADELPHIA — The market was strong here last week. Steel grades were bought at previously quoted prices, but there were advances in the turnings, low phos and cast markets. Machine shop and mixed turnings were up 50¢. Shoveling turnings were up $1.00. Low phos grades were up 50¢. Cast grades were up $1.00. Shipments continued at low volume due to shortages of steel grades in the yards. Bundles were still being limited by consumers.

NEW YORK—Brokers have generally held to their $23.00 a ton price for No. 1 steel though there were occasional small buys at $23.25. Reports that $24.00 is being paid for tonnages cannot be confirmed because there are few, if any, big stockpiles in this area. While No. 1 is holding awaiting mill action, secondary steelmaking grades were stronger and the market tone is bullish. Cast grades are getting tighter. Broker buying prices are unchanged though south Jersey truckers are paying fancy prices to dealers.

DETROIT—With April lists out of the way, some of the steam has escaped from the Detroit market but underlying pressures continue strong. This is to be expected with GM and Ford hitting new high production levels and almost every producer in the industry reporting new sales records almost daily. It is now fairly certain that conversion will go into the third quarter in sizable volume and a good proportion of scrap moving today is going into conversion channels, according to trade sources. Meanwhile, large mills continue to shy away from the present scrap prices.

CLEVELAND—Brokers and mill buyers are trying to wait each other out in a very strong scrap market here and in the Valley. Prices are wild and the rumors are wilder, but major effort is in the $34.00 range. Some brokers are trying to sell some mills at that figure, but no dice. Mills are gambling that the market will collapse if they can hold out long enough, despite the converters. What mills will pay for tonnage was anybody's guess at press time but the fact remains that they need it.

ST. LOUIS—There is a strong undertone to the market and dealers have again stepped up their buying prices on heavy melting steel. They say there is a demand from other markets. Meanwhile farmers are not bringing in much scrap. Correction: The price of No. 2 bundled sheets appearing in the Mar. 30 issue was a typographical error. It should have read $24.50 to $25.00, the same price as No. 2 heavy melting steel.

BOSTON—Order volume and shipments were looking a little better this week. Bearing out a trend that has continued for 4 or 5 weeks, prices for steelmaking grades advanced by about 50¢ a ton. The quotation on No. 1 heavy melting steel was up to $21.00 to $21.50, contrasted with a $20.00 to $21.00 quotation the previous week. Cast business was reported to be better than it was a month ago.

CINCINNATI—All No. 1 grades were moving here in a flurry of trading this week. The market, with the exception of No. 2 grades, is very strong. Blast furnace material is moving well at quoted prices, and foundry grades are showing fair activity.

BIRMINGHAM—No. 1 heavy melting steel has advanced as much as $1.50 a ton here. In other developments reflecting strength in the Birmingham steelmaking district, Republic Steel Corp. is allowing Florida dealers to ship material on an Atlanta freight base. Previously Florida dealers had paid freight on a straight delivered Gadsden, Ala., base. Republic's concession particularly affects dealers in south Florida. In the Tampa area for example, dealers net approximately $1.50 more on bundles.

BUFFALO — Moderating weather spurred the movement of scrap during the week and helped dealers to cover recent large sales. Additional light sales were reported to smaller consumers within the advanced ranges. A steady tone generally ruled the coverage.

District iron output soared to 100 pct of capacity with an estimated 75 to 85 pct moving into steel making operations. Buffalo steel rate 104 pct.

INTEGRATE YOUR PLANT
by BALING your Sheet Metal Scrap

A well organized metal working plant which generates a volume of sheet metal stampings or clippings should include equipment for processing such scrap into compact bales of correct size and density for remelting. As such, it becomes valuable "raw material" in the production of new metal — sheets, strip, bars and ingots — and contributes to the conservation of natural resources.

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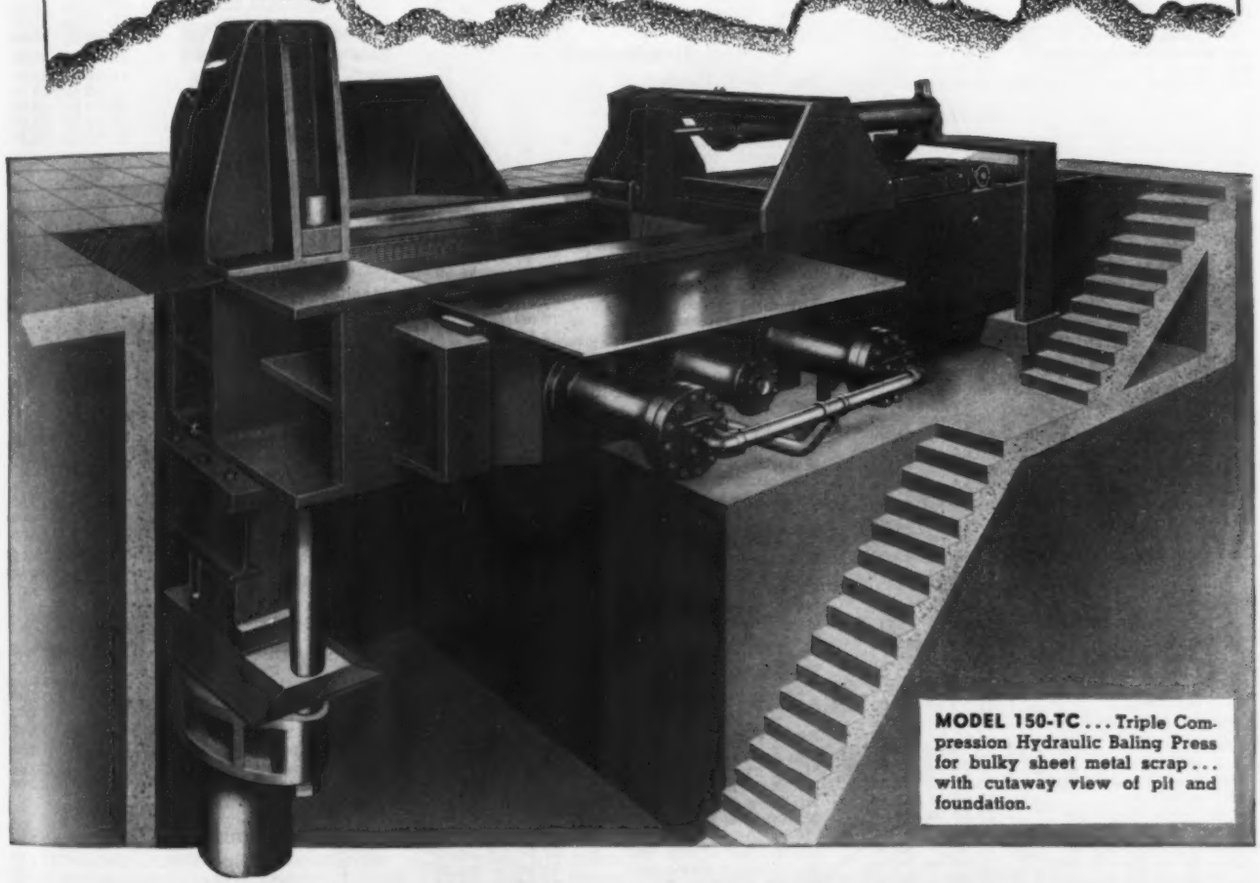


MODEL 150-TC . . . Triple Compression Hydraulic Baling Press for bulky sheet metal scrap . . . with cutaway view of pit and foundation.

GALLAND-HENNING
SCRAP METAL BALING PRESSES

Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$32.50 to $33.00
No. 2 hvy. melting	28.50 to 29.00
No. 1 bundles	32.50 to 33.00
No. 2 bundles	25.50 to 26.00
Machine shop turn.	23.00 to 23.50
Mixed bor. and ms. turns.	23.00 to 23.50
Shoveling turnings	25.50 to 26.00
Cast iron borings	25.50 to 26.00
Low phos. plate	35.50 to 36.00
Heavy turnings	28.00 to 29.00
No. 1 RR. hvy. melting	34.50 to 35.00
Scrap rails, random lgth.	37.00 to 37.50
Rails 2 ft and under	39.00 to 40.00
RR. steel wheels	36.50 to 37.00
RR. spring steel	36.50 to 37.00
RR. couplers and knuckles	36.50 to 37.00
No. 1 machinery cast	39.00 to 40.00
Mixed yard cast.	35.50 to 36.00
Heavy breakable cast.	33.00 to 34.00
Malleable	35.00 to 36.00

Chicago

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 factory bundles	28.00 to 29.00
No. 1 dealers' bundles	27.00 to 28.00
No. 2 dealers' bundles	24.00 to 25.00
Machine shop turn.	17.50 to 18.50
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. forge crops	32.00 to 33.00
Low phos. plate	31.00 to 32.00
No. 1 RR. hvy. melting	30.00 to 31.00
Scrap rails, random lgth.	34.00 to 35.00
Rerolling rails	45.00 to 46.00
Rails 2 ft and under	41.00 to 42.00
Locomotive tires, cut	34.00 to 35.00
Cut bolsters & side frames	31.00 to 32.00
Angles and splice bars	37.00 to 38.00
RR. steel car axles	44.00 to 45.00
RR. couples and knuckles	32.00 to 33.00
No. 1 machinery cast.	41.00 to 42.00
No. 1 agricul. cast.	38.00 to 39.00
Heavy breakable cast.	30.00 to 31.00
RR. grate bars	29.00 to 30.00
Cast iron brake shoes	30.00 to 31.00
Cast iron car wheels	36.00 to 37.00
Malleable	40.00 to 41.00

Philadelphia

No. 1 hvy. melting	$25.00 to $25.50
No. 2 hvy. melting	23.00 to 23.50
No. 1 bundles	25.00 to 25.50
No. 2 bundles	18.50 to 19.50
Machine shop turn.	17.50 to 18.00
Mixed bor. and turn.	16.50 to 17.00
Shoveling turnings	20.00 to 20.50
Low phos. punchings, plate	29.00 to 29.50
Low phos. 5 ft and under	28.00 to 28.50
Low phos. bundles	26.50 to 27.00
Hvy. axle forge turn.	25.00 to 25.50
Clean cast chem. borings	29.00 to 30.00
RR. steel wheels	30.00 to 31.00
RR. spring steel	30.00 to 31.00
Rails 18 in. and under	38.50 to 39.50
No. 1 machinery cast	37.00 to 38.00
Mixed yard cast	32.00 to 33.00
Heavy breakable cast.	34.00 to 35.00
Cast iron carwheels	39.00 to 40.00
Malleable	39.00 to 40.00

Cleveland

No. 1 hvy. melting	$29.00 to $29.50
No. 2 hvy. melting	27.00 to 27.50
No. 1 busheling	29.00 to 29.50
No. 1 bundles	29.00 to 29.50
No. 2 bundles	23.50 to 24.00
Machine shop turn.	19.50 to 20.00
Mixed bor. and turn.	22.50 to 23.00
Shoveling turnings	22.50 to 23.00
Cast iron borings	22.50 to 23.00
Low phos. 2 ft and under	30.00 to 30.50
Steel axle turn.	28.00 to 28.50
Drop forge flashings	29.00 to 29.50
No. 1 RR. hvy. melting	33.00 to 33.50
Rails 3 ft and under	42.00 to 43.00
Rails 18 in. and under	43.00 to 44.00
No. 1 machinery cast.	43.00 to 44.00
RR. cast	43.00 to 44.00
RR. grate bars	31.00 to 32.00
Stove plate	35.00 to 36.00
Malleable	39.00 to 40.00

Youngstown

No. 1 hvy. melting	$32.50 to $33.00
No. 2 hvy. melting	30.50 to 31.00
No. 1 bundles	32.50 to 33.00
No. 2 bundles	$25.50 to $26.00
Machine shop turn.	22.00 to 22.50
Shoveling turnings	24.00 to 24.50
Cast iron borings	24.00 to 24.50
Low phos. plate	33.50 to 34.00

Buffalo

No. 1 hvy. melting	$29.50 to $30.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 busheling	27.50 to 28.00
No. 1 bundles	28.50 to 29.00
No. 2 bundles	26.00 to 26.50
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	19.00 to 19.50
Shoveling turnings	20.50 to 21.00
Cast iron borings	19.50 to 20.00
Low phos. plate	31.00 to 31.50
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	38.50 to 39.00
RR. steel wheels	33.00 to 33.50
RR. spring steel	33.00 to 33.50
RR. couplers and knuckles	33.00 to 33.50
No. 1 machinery cast.	36.00 to 37.00
No. 1 cupola cast.	33.00 to 33.50
Stove plate	32.00 to 32.50
Small indus. malleable	30.00 to 30.50

Birmingham

No. 1 hvy. melting	$24.00
No. 2 hvy. melting	22.00
No. 2 bundles	20.00
No. 1 busheling	23.00
Machine shop turn.	$18.00 to $18.50
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00
Bar crops and plate	28.00 to 29.00
Structural and plate	28.00 to 29.00
No. 1 RR. hvy. melt.	28.00 to 28.50
Scrap rails, random lgth.	29.00 to 30.00
Rerolling rails	36.00 to 37.00
Rails 2 ft and under	35.50 to 36.00
Angles & splice bars	33.50 to 34.50
Std. steel axles	28.00 to 29.00
No. 1 cupola cast.	35.00 to 36.00
Stove plate	30.50 to 31.50
Cast iron carwheels	30.00 to 31.00

St. Louis

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	25.00 to 25.50
No. 2 bundled sheets	25.00 to 25.50
Machine shop turn.	14.00 to 15.00
Shoveling turnings	16.00 to 17.00
Rails, random lengths	33.00 to 34.00
Rails 3 ft and under	37.00 to 39.00
Locomotive tires, uncut	28.00 to 29.00
Angles and splice bars	35.00 to 36.00
Std. steel car axles	41.00 to 43.00
RR. spring steel	31.00 to 32.00
No. 1 machinery cast.	37.00 to 38.00
Hvy. breakable cast.	31.00 to 32.00
Cast iron brake shoes	29.00 to 30.00
Stove plate	29.00 to 30.00
Cast iron car wheels	35.00 to 36.00
Malleable	33.00 to 34.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$22.50 to $23.00
No. 2 hvy. melting	19.00 to 19.50
No. 2 bundles	17.00 to 17.50
Machine shop turn.	13.50 to 14.00
Mixed bor. and turn.	13.50 to 14.00
Shoveling turnings	15.00 to 15.50
Clean cast chem. bor.	23.00 to 24.00
No. 1 machinery cast.	28.00 to 29.00
Mixed yard cast.	26.00 to 26.50
Charging box cast.	27.00 to 27.50
Heavy breakable cast.	27.00 to 27.50
Unstrp. motor blocks	19.50 to 20.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$21.00 to $21.50
No. 2 hvy. melting	17.50 to 18.00
No. 1 bundles	21.00 to 21.50
No. 2 bundles	$16.50 to $17.00
Machine shop turn.	12.50 to 13.00
Mixed bor. and turn.	12.50 to 13.00
Shoveling turnings	14.00 to 14.50
No. 1 busheling	20.50 to 21.00
Clean cast chem. borings	19.00 to 19.50
No. 1 machinery cast.	27.00 to 27.50
No. 2 machinery cast.	22.00 to 23.00
Heavy breakable cast.	22.00 to 23.00
Stove plate	20.00 to 21.00

Detroit

Brokers' buying prices per gross ton, on cars

No. 1 hvy. melting	$24.50 to $25.00
No. 2 hvy. melting	22.00 to 22.50
No. 1 bundles	26.50 to 27.00
New busheling	26.50 to 27.00
Flashings	24.50 to 25.00
Machine shop turn.	17.00 to 17.50
Mixed bor. and turn.	17.00 to 17.50
Shoveling turnings	19.50 to 20.00
Cast iron borings	19.50 to 20.00
Low phos. plate	26.50 to 27.00
No. 1 cupola cast.	34.00 to 35.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	28.00 to 29.00
Automotive cast.	39.00 to 40.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$28.00 to $28.50
No. 2 hvy. melting	23.50 to 24.00
No. 1 bundles	28.00 to 28.50
No. 2 bundles	18.50 to 19.00
Machine shop turn.	16.50 to 17.00
Mixed bor. and turn.	16.50 to 17.00
Shoveling turnings	17.50 to 18.00
Cast iron borings	17.50 to 18.00
Low phos. 18 in. under	33.00 to 33.50
Rails, random lengths	34.00 to 35.00
Rails, 18 in. and under	42.00 to 43.00
No. 1 cupola cast	39.00 to 40.00
Hvy. breakable cast	33.00 to 34.00
Drop broken cast	42.00 to 43.00

San Francisco

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	20.00
Scrap rails, random lgth.	20.00
No. 1 cupola cast.	$30.00 to 33.50

Los Angeles

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Mach. shop turn.	5.00
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	$32.50 to 35.00

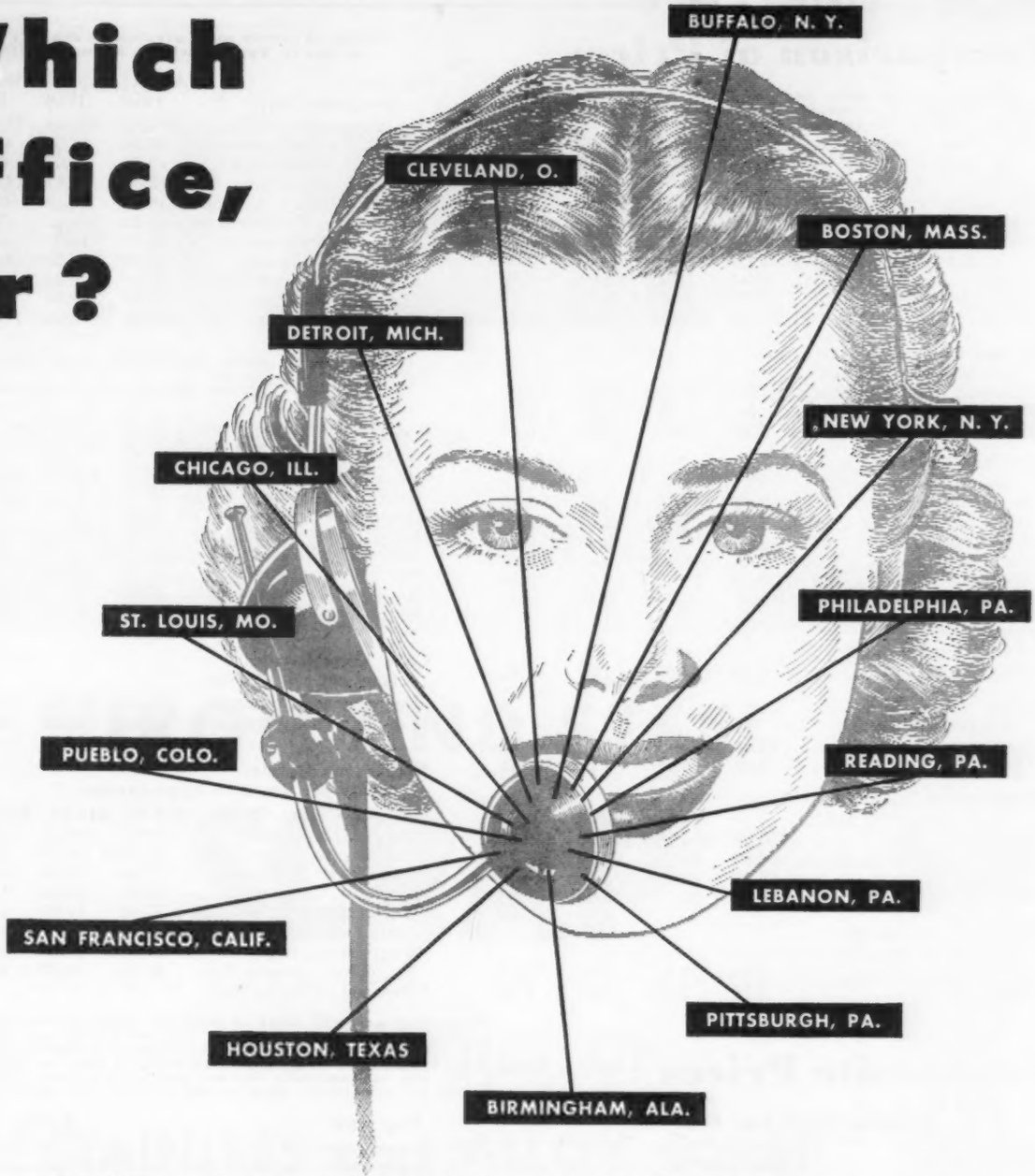
Seattle

No. 1 hvy. melting	$18.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Elec. fur. 1 ft and under	$25.00 to 28.00
RR. hvy. melting	19.00
No. 1 cupola cast.	30.00
Heavy breakable cast.	20.00

Hamilton, Ont.

No. 1 hvy. melting	$24.00
No. 1 bundles	16.00
No. 2 bundles	16.00
Mechanical bundles	22.00
Mixed steel scrap	20.00
Mixed bor. and turn.	18.00
Rails, remelting	24.00
Rails, rerolling	27.00
Bushelings	18.50
Bush., new fact, prep'd.	22.00
Bush., new fact, unprep'd.	17.00
Short steel turnings	18.00
Cast scrap	$40.00 to 43.00

Which office, sir?



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Apr. 11, 1950	Apr. 4, 1950	Mar. 14, 1950	Apr. 12, 1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plates	3.50	3.50	3.50	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.50	6.50	6.50	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails: dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Apr. 11, 1950	Apr. 4, 1950	Mar. 14, 1950	Apr. 12, 1949
No. 2, foundry, Phila.	$50.42	$50.42	$50.42	$50.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	49.08	49.47
No. 2, Birmingham	42.38	42.38	42.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	49.76
Basic, Valley furnace	46.00	46.00	46.00	46.50
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese‡	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$32.75	$32.75	$32.25	$24.75
Heavy melt'g steel, Phila.	25.25	25.25	23.00	23.50
Heavy melt'g steel, Ch'go	28.50	28.50	28.50	22.50
No. 1 hy. com. sh't, Det.	26.75	26.75	25.50	17.50
Low phos. Young'n	33.75	33.75	32.75	27.50
No. 1, cast, Pittsburgh	39.50	39.50	39.50	36.50
No. 1, cast, Philadelphia	37.50	36.50	35.50	28.00
No. 1, cast, Chicago	41.50	40.50	39.50	31.00
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.00	$14.50
Foundry coke, prompt	16.25	16.25	15.75	16.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	$18.50	$18.50	$18.50	$23.375
Copper, Lake Conn.	18.625	18.625	18.625	23.625
Tin Straits, New York	76.125†	74.75*	75.25	$1.03
Zinc, East St. Louis	10.50	10.50	10.00	15.00
Lead, St. Louis	10.30	10.30	10.30	14.80
Aluminum, virgin	17.00	17.00	17.00	17.00
Nickel electrolytic	42.97	42.97	42.97	42.93
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50

* Revised. † Tentative.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
Apr. 11, 1950	3.837¢ per lb.	$46.38 per gross ton	$28.83 per gross ton
One week ago	3.837¢ per lb.	46.38 per gross ton	28.83 per gross ton*
One month ago	3.837¢ per lb.	46.38 per gross ton	27.92 per gross ton
One year ago	3.749¢ per lb.	46.66 per gross ton	23.58 per gross ton

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3	$46.38 Feb. 7	$45.88 Jan. 3	$28.83 Apr. 4	$26.25 Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396c Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1932	1.89196¢ July 5	1.83910¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron as Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

* Corrected.

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–PERSONAL ENOUGH FOR SMALL

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Over 50 Years
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STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00 1													$50.00 31
Alloy, net ton	$51.00 1.17													$51.00 31
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00 1	$53.00 1	$53.00 1				$57.00 13		$53.00 3	$58.00 26	$53.00 3			
Carbon forging billets, net ton	$63.00 1	$63.00 1.4	$63.00 1.8	$63.00 4			$63.00 28		$63.00 3.4	$65.00 26	$63.00 3			$63.00 31
Alloy, net ton	$66.00 1.17	$66.00 1.4	$66.00 1		$66.00 4.42		$66.00 13	$66.00 3	$66.00 3.4	$68.00 26	$66.00 3			$68.00 31
SHEET BARS							$57.00 13							
PIPE SKELP	3.15 1						3.15 1.4							
WIRE RODS	3.85 2.18	3.85 2.4.33	3.85 6	3.85 3			3.85 6				3.85 3	3.95 3		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35 1.5.9.15	3.35 23	3.35 1.6.8	3.35 4.5			3.35 1.4.6.13		3.35 3	3.45 26		3.35 3		3.55 12
Cold-rolled	4.10[1-5] 7.9.15.63		4.10 1.6.8	4.10 4.15		4.10 7	4.10 4.6		4.10 3			4.10 3	4.30 22	4.30 12
Galvanized (10 gage)	4.40 1.9.15		4.40 1.8		4.40 4		4.65[64] 4.75[14]					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40[6] 4.90[76]						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9.15		4.80 1			4.80 7	4.80 64							
Hi Str. low alloy, h.r.	5.05 1.5.9	5.05 1	5.05 1.6.8	5.05 4.5			5.05 1.4.6.13		5.05 3	5.05 26		5.05 3		5.25 12
Hi str. low alloy, c.r.	6.20 1.5.9		6.20 1.6.8	6.20 4.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
Hi str. low alloy, galv.	6.75 1											6.75 3		
STRIP Hot-rolled	3.25 5.7.9.28	3.25 3.66	3.25 1.6.8	3.25 5			3.25 1.4.6.13		3.25 3	3.35 26		3.25 3		3.45 12.47
Cold-rolled	4.15 5.7.9.63	4.30 3.66	4.30 8	4.15 2.5		4.15 7	4.15 4.6.13.40.49.49		4.15 3			4.15 3		4.40[8.8] 4.35[12.47]
Hi str. low alloy, h.r.	4.95 9		4.95 1.6.8	4.95 5			4.95 1.4.6.13		4.95 3	4.85 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.20 9			6.20 2.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
TINPLATE[4] Cokes, 1.50 lb base box 1.25 lb. deduct 20¢	$7.50 1.5.9.15		$7.50 1.6.8				$7.50 4					$7.60 3	$7.70 22	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30 1.5.15		5.30 1.6				5.30 4					5.40 3	5.50 22	
BARS Carbon steel	3.45 1.5.9.17	3.45 1.4.23	3.45 1.6.8	3.45 4	3.45 4		3.45 1.4.6		3.45 3.4		3.45 3			3.65 12
Reinforcing‡	3.45 1.5	3.45 4	3.45 1.6.8	3.45 4			3.45 1.4.6		3.45 3.4		3.45 3	3.45 3		
Cold-finished	4.10[3] 4.15[2-4] 17.52.69.71	4.15[2] 23.69.70	4.15 4.73.74	4.15 2.61	4.15 4.32.52		4.15 6.40.57		4.15 70					4.35[12] 4.30[4]
Alloy hot-rolled	3.95 1.17	3.95 1.4.23	3.95 1.6.8		3.95 4		3.95 1.6.25	3.95 3	3.95 3.4		3.95 3			4.25 12
Alloy, cold-drawn	4.90 2.17.52.69.71	4.90 2.23.69.70	4.90 4.73.74	4.90 2.61	4.90 4.42.52		4.90 6.25.57	4.90 3	4.90 3.70					5.05[4]
Hi str. low alloy, h.r.	5.20 1.5		5.20 1.6.8	5.20 4			5.20 1.6	5.20 3	5.20 3		5.20 3			5.40 12
PLATE Carbon steel	3.50 1.5	3.50 1	3.50 1.6.8	3.50 4			3.50 1.18		3.50 3	3.60 26	3.50 3	3.50 3		3.75 12
Floor Plates	4.55 1	4.55 1	4.55 3	4.55 5						4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 18			4.40 26	4.40 3	4.40 3		
Hi Str. low alloy	5.35 1.5	5.35 1	5.35 1.3	5.35 4.5			5.35 6			5.35 26	5.35 3	5.35 3		5.60 12
SHAPES, Structural	3.40 1.5.9	3.40 1.23	3.40 1.6.8					3.45 3	3.45 3		3.45 3			
Hi Str. low alloy	5.15 1.5	5.15 1	5.15 1.6.8				5.15 6	5.15 3	5.15 3		5.15 3			
MANUFACTURER'S WIRE Bright	4.50 2.5.18	4.50[2] 4.12.33.84		4.50 2.77			4.50 6	Kokomo=4.60[30]			4.50 3	4.60 3	Duluth=4.50[2] Pueblo=4.75[14]	
PILING, Steel Sheet	4.20[1-9]	4.20 1							4.20 3					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
					INGOTS Carbon forging net ton
	$59.00 83				Alloy, net ton
		$53.00 11	F=$72.00[19]		**BILLETS, BLOOMS, SLABS** Carbon, rerolling, net ton
	$71.00 83	$63.00 11	F=$82.00[19]	Geneva=$61.00[16]	Carbon forging billets, net ton
	$74.00 83		F=$85.00[19]		Alloy net ton
				Portsmouth=$55.00[20]	**SHEET BARS**
					PIPE SKELP
	4.25 83	3.85 11	SF=4.50[24] LA=4.65[24,62]	Portsmouth=3.85[20] Worcester=4.15[2]	**WIRE RODS**
		3.35 4,11	SF, LA=4.05[24] F=4.25[19]	Ashland[7]=3.35 Niles=3.50[64]	**SHEETS** Hot-rolled (18 ga. & hvr.)
		4.10 11	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40 4,11	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05 11	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85 83	3.65 83	3.25 11	SF, LA=4.00[24,62] F=4.40[19], S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	**STRIP** Hot-rolled
			F=5.40[19] LA=5.50[27]	New Haven=4.65[2,68]	Cold-rolled
		4.95 11	F=6.64[19]		Hi Str. low alloy, h.r.
			F=6.95[19]		Hi Str. low alloy, c.r.
		7.60 11	SF=8.25[24]		**TINPLATE** Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05 83	3.85 83	3.45 4,11	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.60[65]	**BARS** Carbon steel
4.05 83	3.85 83	3.45 4,11	SF, S=4.20[62] F=4.10[19]	Atlanta=3.60[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55 83	4.35 83		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[2]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90 83	3.50 4,11	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.60[29] Coatesville=3.60[21] Harrisburg=3.50[35]	**PLATE** Carbon steel
				Harrisburg=4.55[35]	Floor plates,
			F=5.40[19]	Coatesville=4.50[21]	Alloy
		5.35 11	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00 83	3.80 83	3.40 11	SF=3.95[62] LA=4.00[24,62]	Phoenixville=3.30[56] Geneva=3.40[16]	**SHAPES**, Structural
		5.15 11	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi Str. low alloy
5.10 83	4.90 83	4.50 4,11	SF, LA=5.45[24,62]	Portsmouth=4.50[20] Worcester=4.80[2]	**MANUFACTURER'S WIRE** Bright

Notes: †Special coated mfg ternes deduct $1.00 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Co., Inc., Oakland, Calif.
20 Portsmouth Steel Corp., Portsmouth, Ohio
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Indianapolis
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	Pittsburg, Calif.
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	116	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	Pittsburg, Calif.
Merch. wire, annealed‡	$5.35	$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance, 12¢.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.
Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.
Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Wareham, Mass., 53.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon		
10 pct, Coatesville (26)	27.50	
Inconel-carbon		
10 pct, Coatesville (21)	36.00	
Monel-carbon		
10 pct, Coatesville (21)	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	6.20
Electrical	6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*, add 0.20¢; Indiana Harbor, Ind., 3; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. shorter	26	37
All diam., longer than 6 in.	22	34
Lag, all diam over 6 in. & longer	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

	Pct Off List	
½ in. and smaller	25	37
9/16 to ⅝ in.	23	35
¾ to 1½ in. inclusive	23	35
1⅝ in. and larger	16	29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 to ⅝ in.	36	30	36
¾ to 1½ in.	31	27	33
1⅝ in. and larger	21	17	

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.
**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger)
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa. $7.25

Small Rivets

(7/16 in. and smaller)
Pct Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 43

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter high C heat treated	54
Milled studs	28
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in., diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Pittsburg, Torr., Calif.; Seattle	4.35
Track bolts, untreated**	8.85
Track bolts, heat treated, to railroads**	9.10

** Minnequa, deduct 35¢
† Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.
Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.
Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.
Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.
Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.
Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.
Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$24.00
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	23.40
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	21.25
Swedeland, Pa., f.o.b.	21.20
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.63
Cincinnati, del'd	22.71
St. Paul, f.o.b.	22.50
St. Louis, del'd	21.60
Birmingham, del'd	20.20

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net; Effective CaF, content:

70% or more	$37.00
60% or less	34.00

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.50	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa. 41; McKeesport Pa. 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

REFRACTORIES (*F.o.b. works*)

Fire Clay Brick — *Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $86.00
No. 1 Ohio 80.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 80.00
No. 2 Ohio 72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $86.00
Childs, Pa. 90.00
Hays, Pa. 91.00
Chicago District 95.00
Western, Utah and Calif. 101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago 106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 15.00
Silica cement, net ton, bulk, Hays, Pa. 17.00
Silica cement, net ton, bulk, Ensley, Ala. 16.00
Silica cement, net ton, bulk, Chicago District 16.00
Silica cement, net ton, bulk, Utah and Calif. 22.50

Chrome Brick — *Per Net Ton*

Standard chemically bonded, balt., Chester $69.00

Magnesite Brick

Standard, Baltimore $91.00
Chemically bonded, Baltimore 80.00

Grain Magnesite — *St. ¾-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed ... $56.00 to $57.00
Domestic, f.o.b. Chewelah, Wash., in bulk 33.00
in sacks 38.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ ... $12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags ... 7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East ..... 10.00¢
Domestic sponge iron, 98+% Fe, carload lots ..... 9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mech, 99+% Fe ..... 48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe .. 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe 70.0¢ to $1.35
Aluminum ..... 31.50¢
Brass, 10 ton lots ..... 23.50¢ to 27.25¢
Copper, electrolytic ..... 27.75¢
Copper, reduced ..... 27.00¢
Cadmium, 100-199 lb $2.95
Chromium, electrolytic, 99% min., any quantity $3.50
Lead ..... 17.00¢
Manganese ..... 52.00¢
Molybdenum, 99% $2.65
Nickel, unannealed ..... 56.00¢ to 66.00¢
Nickel, annealed ..... 72.00¢
Nickel, spherical, unannealed 69.00¢
Silicon ..... 34.00¢
Solder powder .... 8.5¢ plus metal values
Stainless steel, 302 ..... 75.00
Tin ..... 85.75¢
Tungsten, 99% $2.90
Zinc, 10 ton lots ..... 15.75¢ to 18.50¢

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
	GRAPHITE	
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
	CARBON	
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
20	84, 90	7.50¢
17	60, 72	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price, about $200.00 per net ton

Standard, T & C

Steel, Buttweld*	Black	Galv
⅛-in.	40½ to 38½	24 to 22
¼-in.	43½ to 41½	28 to 26
⅜-in.	46 to 44	31 to 29
1¼-in.	46½ to 44½	31½ to 29½
1½-in.	47 to 45	32 to 30
2-in.	47½ to 45½	32½ to 30½
2½ to 3-in.	48 to 46	33 to 31
Steel, lapweld		
2-in.	38	22½
2½ to 3-in.	42	26½
3½ to 6-in.	43 to 40	27½ to 24½
Steel, seamless		
2-in.	36	20½
2½ to 3-in.	39	23½
3½ to 6-in.	41	25½
Wrought Iron, buttweld		
⅛-in.	+26½	+53
¼-in.	+16½	+42
⅜ & 1¼-in.	+10½	+33
1½-in.	+ 4½	+29½
2-in.	+ 4	+29
Wrought Iron, lapweld		
2-in.	+13½	+37
2½ to 3½-in.	+11	+32½
4-in.	+ 6	+26½
4½ to 8-in.	+ 8	+28
9 to 12-in.	+18	+37½

Extra Strong, Plain Ends

Steel, buttweld		
⅛-in.	39½ to 37½	24½ to 22½
¼-in.	43½ to 41½	28½ to 26½
⅜-in.	45½ to 43½	31½ to 29½
1¼-in.	46 to 44	32 to 30
1½-in.	46½ to 44½	32½ to 30½
2-in.	47 to 45	33 to 32
2½ to 3-in.	47½ to 45½	33½ to 31½
Steel, lapweld		
2-in.	37	22½
2½ to 3-in.	42	27½
3½ to 6-in.	44½ to 41½	30 to 27
Steel, seamless		
2-in.	35	20½
2½ to 3-in.	39	24½
3½ to 6-in.	42½	28
Wrought Iron, buttweld		
⅛-in.	+22	+47
¼-in.	+15½	+40
⅜ to 2-in.	+ 5½	+29
Wrought Iron, lapweld		
2-in.	+10½	+33½
2½ to 4-in.	+ 1	+22
4½ to 6-in.	+ 5	+26½
7 & 8-in.	list	+21½
9 to 12-in.	+11½	+29½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in in.	gage BWG	Seamless H.R.	Seamless C.R.	Electric H.R.	Weld C.D.
2	13	$20.61	$24.24	$19.99	$23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago .. $91.80 to $95.30
6 to 24-in. del'd N. Y. ... 91.00 to 92.00
6 to 24-in., Birmingham .. 78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... $108.50 to $113.00
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20¢ to base price except Birmingham, Cincinnati, New Orleans (*), add 15¢; Philadelphia, add 25¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.05	6.24-6.44[1]	6.46-6.46[2]	5.59-5.59[11]	....	5.20-5.64[11]	5.49	5.49-5.49[11]	6.19	9.69	9.99	11.12	11.46
Birmingham*	5.05[10]	5.80	6.15[7]	5.10[10]	....	5.20	5.05	5.00[10]	6.73	....	....	....	....
Boston	5.73	6.48[20]-6.85	6.79-7.24[21]	5.78	6.90-6.95	5.88	5.55	5.60	6.02-6.58	9.70-9.97	8.50-10.37	11.15	11.46
Buffalo	5.05	5.80	6.80	5.41	7.27	5.45	5.15	5.05	5.75	9.60	9.90	11.05	11.35
Chicago	5.05	5.80	6.70	5.10	5.45-6.16	5.20	5.05	5.00	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.32-5.97	5.80-6.24	6.29-6.39	5.49	....	5.59-5.74	5.44-5.59	5.39-5.84	6.10-6.25	9.60-9.81	9.90-10.11	11.05-11.26	11.35-11.56
Cleveland	5.05	5.80	6.95	5.24	6.35	5.32	5.17	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27-6.58	5.59	5.44	5.39	6.03	9.56	9.86	11.01	11.31
Houston	5.75	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35-10.45	10.50-10.60	11.50	11.85-12.10
Indianapolis	....	....	....	....	7.35	....	....	....	....	....	....	....	....
Kansas City	5.65	6.40	7.30	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.60
Los Angeles*	5.80	7.30	7.45[2]	5.85	8.35[16]	5.80	5.70	5.80	7.80	10.05	10.20	11.70	12.10
Memphis	5.93	6.68	....	5.98	6.80	6.08	5.93	5.68	....	....	....	....	....
Milwaukee	5.19	5.94	6.84	5.24	6.32	5.34	....	5.14	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.85[1]	....	5.55[1]	6.90[1]	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.55-5.65	6.54-6.64	6.90-7.00	5.84	6.76[5]	5.70	5.45	5.65	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10	7.00	....	6.30	....	6.15	6.20	6.15	7.20	....	....	....	....
Omaha	....	....	....	....	....	....	....	....	....	....	....	....	....
Philadelphia*	5.30	6.20	6.70	5.65	6.29	5.45	5.25	5.50	6.31[22]	9.35	9.65	10.80	11.10
Pittsburgh	5.05	5.80	6.70	5.20	6.00	5.20	5.05	5.00	5.75	9.25	9.55	10.70	11.00
Portland	6.60-7.10[1]	8.40[2]	8.20[2]	6.85[9]	....	6.40[9]	6.50	6.45-6.45[9]	8.60[14]	12.00[18]	11.60[18]	....	....
Salt Lake City	5.85	6.70	8.75	7.45	8.75	6.10[3]	5.90	7.35[8]	8.75	....	....	....	....
San Francisco	6.25[11]	7.60[2]	7.50[2]	6.75[11]	7.85[16]	6.15[11]	6.00[11]	6.15[11]	7.80	10.05	10.20	11.70	12.10
Seattle	6.70[4]	8.15[2]	8.20[2]-8.35[2]	6.90[4]	....	.35[4]	6.25[4]	6.35[4]	8.50[14]	....	11.60[18]	....	13.50[18]
St. Louis	5.38	6.13	7.03	5.43	6.68-7.54	5.53	5.38	5.33-5.35	6.08	9.58	9.88	11.03	11.33
St. Paul	5.76	6.51	7.41	5.81	6.16-6.82	5.91	5.76	5.71	6.42	9.96	10.26	11.41	11.71

BASE QUANTITIES: (*Standard unless otherwise keyed on prices*).

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 1000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles; (22) 2000 lb and over.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....
Birmingham	41.88	42.38	....	....	.....
Buffalo	46.00	46.50	47.00	....	.....
Chicago	46.00	46.50	46.50	47.00	.....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	.....
Erie	46.00	46.50	46.50	47.00	.....
Everett	....	50.50	51.00	....	.....
Granite City	47.90	48.40	48.90	....	.....
Ironton, Utah	46.00	46.50	....	....	.....
Pittsburgh	46.00	46.50	46.50	47.00	.....
Geneva, Utah	46.00	46.50	....	....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....
Steelton	46.00	46.50	49.00	49.50	54.00
Struthers, Ohio	46.00	....	....	....	.....
Swedeland	46.00	46.50	49.00	49.50	.....
Toledo	46.00	46.50	46.50	47.00	.....
Troy, N. Y.	46.00	46.50	49.00	....	54.00
Youngstown	46.00	46.50	46.50	47.00	....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	50.50	51.00	.....	.....
Boston	Steelton	6.90	.....	....	....	.....	60.90
Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Cincinnati	Birmingham	6.70	48.58	49.08	....	....	.....
Jersey City	Bethlehem	2.63	....	51.13	51.63	52.13	.....
Los Angeles	Geneva-Ironton	7.70	53.70	54.20	....	....	.....
Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Philadelphia	Steelton	3.09	....	....	....	.....	57.09
Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
San Francisco	Geneva-Ironton	7.70	53.70	54.20	....	.....	.....
Seattle	Geneva-Ironton	7.70	53.70	54.20	....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

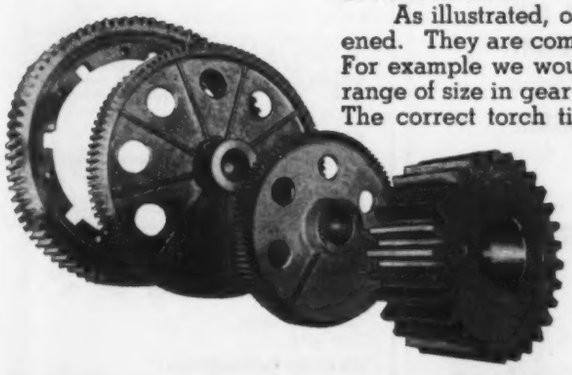
Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.

The right TORCH TIP to fit the Gear Tooth Size . . . The Secret of NE Uniformity in Flame Hardening

In the Flame Hardening heat treatment of Neloy or Neloy Moly Alloy Steel gears for the machines of industry, the right torch tip to fit the tooth size is of prime importance. Penetration of hardness to the proper depth for a given size of gear tooth, and core toughness can be obtained uniformly in no other way. Directing the flame to the teeth from a torch tip that fits the tooth size is assured at National-Erie . . . It is a standard "Must" that is never overlooked.

As illustrated, our torch tips are developed to fit the tooth size to be hardened. They are comparable in sizes to the standard range gear cutters or hobs. For example we would use the same tip for a 1 D.P. and 3" C.P. tooth. Each range of size in gear teeth requires a torch tip that fits the tooth to be hardened. The correct torch tip plus National-Erie skill in flame hardening assures the combination of a high surface hardness comparable to the carburizing or case hardened treatment, with a core toughness of a fully quenched medium carbon alloy steel.



A range of torch tips has also been developed by our engineers with the same care, for the flame hardening of track wheel treads and rope sheave grooves. They also are illustrated. Full details are yours in Bulletin No. 9. Write for it.

NATIONAL ERIE CORPORATION

ERIE, PENNSYLVANIA • U. S. A.

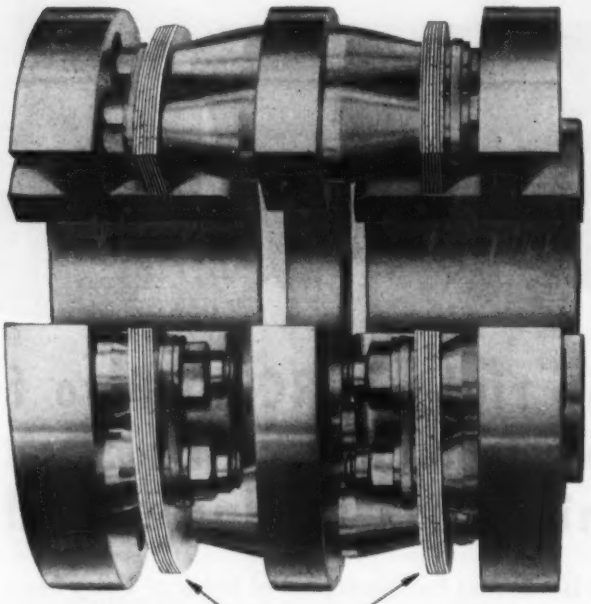
THOMAS *Flexible* ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



PATENTED FLEXIBLE DISC RINGS

BACKLASH FRICTION WEAR and CROSS-PULL are eliminated

LUBRICATION IS NOT REQUIRED!

THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

• • •

NO MAINTENANCE PROBLEMS.

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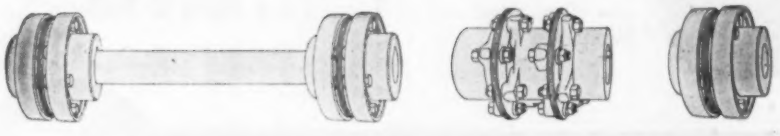
ALL PARTS ARE SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.

WARREN, PENNSYLVANIA

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Manganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 18.15¢

Low-Carbon Manganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $73.50. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max Si.)

0.06% C	28.75	0.20% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.25
2.00% C			27.00
65-69% Cr, 4-9% C			20.50
62-66% Cr, 4-6% C, 6-9% Si.			21.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% max. C	$1.09
0.50% max. C	1.05
9.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

There are two profits in every good product

You've got to be satisfied with a product—or you don't buy it twice.

That's why we say there must be *two* profits in every product we make. *One* profit for you the customer. And *one* profit for us who make it.

Of course, our profit depends on yours. And that's the reason we make many metal cleaning products to do specific metal cleaning jobs. The closer our products fit your jobs, the more profit for you. And subsequently, for us.

It seems to us that such a point of view produces mutual benefits. Why not look into our products when your next metal cleaning problem comes up?

WYANDOTTE CHEMICALS CORPORATION

WYANDOTTE, MICHIGAN • *SERVICE REPRESENTATIVES IN 88 CITIES*

Wyandotte

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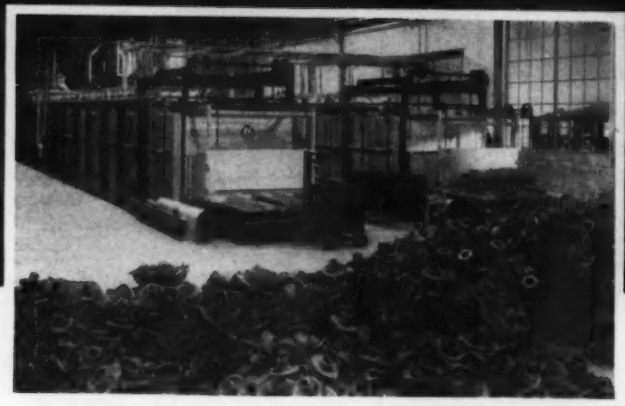
EF MALLEABLE FURNACES



shorten the cycle from days to hours

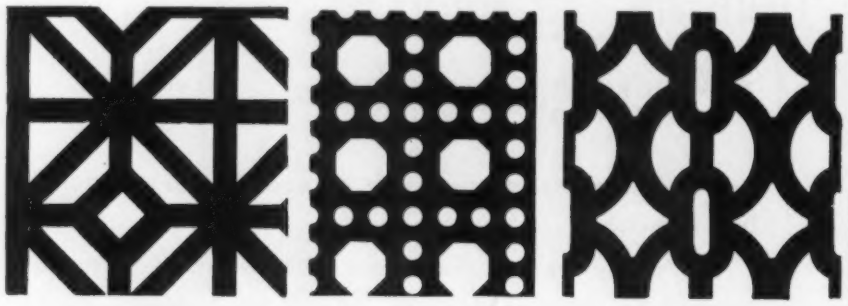
● Packing in pots is entirely eliminated, reducing the fuel requirement — the labor cost and improving working conditions. The tonnage tied up in production is much reduced, speeding deliveries. You'll get a better, more uniform, and scale free product — in shorter time — at lower cost. Continuous or batch types. We build furnaces for *every* annealing and heat treating requirement.

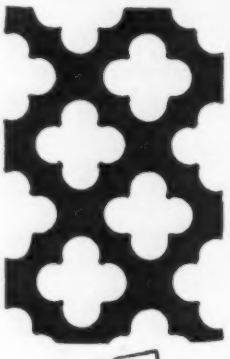
Write today for Bulletin No. 461.

THE ELECTRIC FURNACE CO.

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION

Salem - Ohio





Ornamental perforated metal

Hendrick offers a wide variety of decorative patterns in light weight, perforated metal, for radiator enclosures, stove panels, kitchen cabinets, and similar applications.

Regularly furnished in steel sheets of available stock size, in gauges from 16 to 22. These patterns can also be supplied in other metals on special order. Write for full information.

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Manufacturing Company

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

Continued

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
- Carload ..... 7.65¢
- Ton lots ..... 9.05¢

Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo ..... 96¢

Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.
- Ton lots $3.50
- Less ton lots 3.55

Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $2.67

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.13

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
- 10 tons to less carload 75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.28

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.40
- Less ton lots 1.45

Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $160.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $2.25

Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
- Openhearth $2.90
- Crucible 3.00
- High speed steel (Primos) 3.10

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. ..... 95¢
- bags, f.o.b. Washington, Pa., Langeloth, Pa. ..... 94¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
- Carload, bulk, lump ..... 11.00¢
- Ton lots, bulk, lump ..... 11.50¢
- Less ton lots, lump ..... 12.25¢

Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.20

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
- Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
- Carload, bulk ..... 6.60¢

Boron Agents

Contract prices, per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B $4.25

Bortam, f.o.b. Niagara Falls
- Ton lots, per pound ..... 45¢
- Less ton lots, per pound ..... 50¢

Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.
- Ton lots, per pound ..... 8.625¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20
- F.o.b. Wash., Pa.; 100 lb, up
- 10 to 14% B ..... .75
- 14 to 19% B 1.20
- 19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
- No. 1 ..... 93¢
- No. 6 ..... 63¢
- No. 79 ..... 45¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.
- Ton lots $1.67
- Less ton lots 1.79

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
- Less ton lots $1.80

Silcaz, contract basis, delivered.
- Ton lots ..... 45.00¢

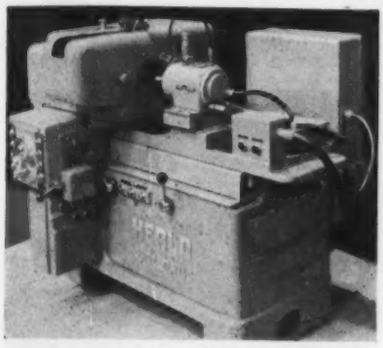
Resume Your Reading on Page 147

NEW

PRODUCTION IDEAS

Continued

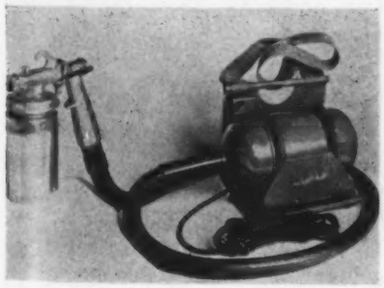
Hi-Frequency equipment are also available. Because these centerless internals are completely automatic, several machines can be tended by one operator. And since all machines operate from a single central



hydraulic power unit, these battery type installations offer savings in initial investment, maintenance and operating costs. *Heald Machine Co. For more information, check No. 37 on the postcard on p. 35.*

Portable Paint Sprayer

A new jet-propelled portable paint spraying plant delivers low pressure, high-volume spray without mist or paint fog. The Genwind gives immediate pressure up to 40 lb without pump or compression

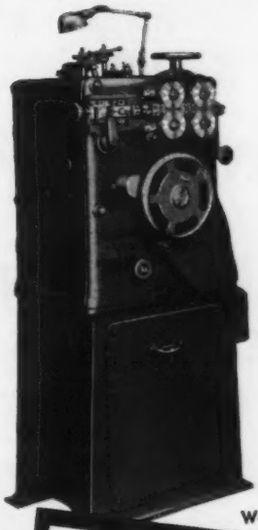


tank, using a series of fans that supply pressure on the jet propulsion principle. Powered by a 110 v, ac/dc universal, former wound motor of ⅜ hp, the unit is suitable for spraying paint, lacquer, ad-

In spring coiling, the words "Torrington" and "Versatile" are synonomous!

When producing springs to meet exacting requirements, the professional springmaker with a Torrington coiler is the man to see. He's the man who can supply your needs with accuracy, speed and economy.

On any special spring, our sales department will be glad to help you find a source of supply, or if need be, help the springmaker devise the tooling to produce it.



W-11

This is the W-11, one of fourteen versatile Torrington Spring Coilers:

SPECIFICATIONS

Wire Diameter Range: .015" to .072"

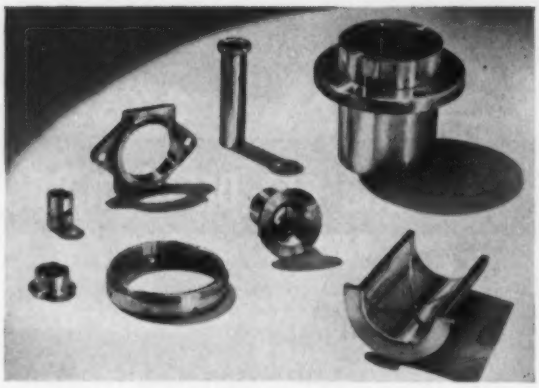
Wire Length per Spring: 0" to 42" (Extra Wire Feed Gears Available)

Coil Range (O.D.): 3/32" to 1-9/16"

Production: 23 to 190 springs per minute with variable speed drive

Torsion and other attachments available

The TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT



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For 40 years NON-GRAN has built a reputation for machining parts to exact specifications—to aircraft tolerances where indicated—and delivering on schedule, at the lowest possible cost. We also sand and centrifugally cast bronze alloys.

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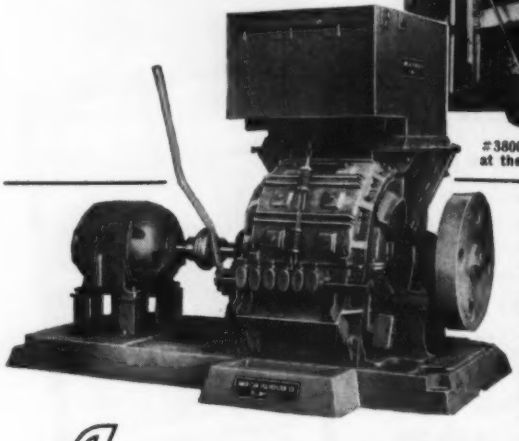
PRECISION MACHINE WORK
NON-GRAN
CASTINGS - SAND & CENTRIFUGAL

SOLVE SCRAP PROBLEMS PROFITABLY

with an

AMERICAN RING METAL TURNINGS CRUSHER

Metal turnings reduced to uniform chips by an American #3800 Crusher are collected for oil reclamation at the Link-Belt Co.'s Ewart Plant, Indianapolis.



Reduced into uniform chips by American shredder ring action, long, curly turnings of steel, aluminum, brass, etc., release valuable cutting oil much more freely—30 to 50 gallons per ton! Add the savings in storage and handling—plus the higher scrap value of short shoveling turnings—and it's easy to see why Americans pay for themselves . . . over and over again.

Send for your copy of "Crushing Turnings Profitably."

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

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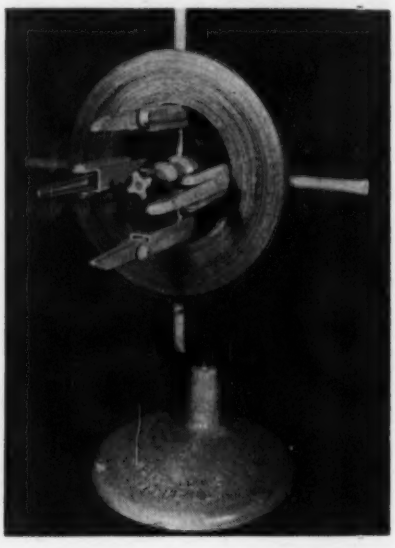
ST. LOUIS 10, MO.

hesives, cleaning solutions, for air-pressure cleaning of machinery, and for power dusting of walls and ceilings. It weighs 10½ lb. *Genwind Corp. of America. For more information, check No.* 38 *on the postcard on p.* 35.

Plain Stock Reel

Stock up to 6 in. wide, coils with 8⅛ to 28 in. ID and 34 to 54 in. OD can be handled on a new plain stock reel. The reel is arranged with collapsible holding forks so that all the operator does is lay the



forks over to allow for loading the coil and snap into place for operation. The reel is adjustable to any angle to suit the press. Core diameters are adjustable. *U. S. Tool Co., Inc. For more information, check No.* 39 *on the postcard on p.* 35.

Static Pressure Tester

Static pressure testing of boilers, piping systems, compressor cylinders and similar pressure vessels is simplified by use of a new, air-operated hydraulic pressure generating device. Developing up to 23,000 psi on air line pressures of 90 psi, the Intensifier weighs 80 lb and is mounted on a two-wheel rubber tired under-carriage for easy portability to any testing job. The unit requires only connection to any ordinary compressed air

METAL finishers using Oakite Compound No. 33 say this new cleaning-phosphating material is just what they've been looking for: a solvent-acid combination that *in one operation* removes oil and rust and conditions the metal surface for painting.

Oakite Compound No. 33 is great for removing rust, heat scale, other oxides, carbon smut, soldering and welding residues, identification inks and oil from steel, cast iron, aluminum sheet and castings.

Oakite Compound No. 33 is a great soak cleaner for metal parts of moderate size; and great for hand-swabbing on large parts like cabinets, desks, doors, tractors and truck cabs.

Oakite Compound No. 33 saves money; frequently eliminating separate pickling operations on moderately rusty steel. It produces splendid paint adhesion.

FREE If you'll drop a line to Oakite Products, Inc., 30H Thames St., New York 6, N. Y., we will be glad to tell you more about Oakite Compound No. 33.

ALSO *ask about Oakite procedures for:*

- Machine cleaning
- Tank cleaning
- Electrocleaning
- Pickling
- Paint stripping
- Burnishing
- Steam-gun cleaning
- Rust prevention

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line. Variable static hydraulic pressures are preset by a turn of the regulator valve that is equipped with a dial-type air pressure gage.

Discharge pressures are indicated on a direct reading dial gage. *Cooper-Bessemer Corp. For more information, check No.* 40 *on the postcard on p.* 35.

Metal Cutting Band Saw

Angles, bars, tubes, and pipe up to 6x9 in. size can be cut on a new low-cost metal cutting band saw, with no burr, minimum kerf, and with accuracy to within a few

thousandths. Four cutting speeds range from 53 to 266 fpm. A hydraulic dash-pot mechanism insures constant, controlled pressure from beginning to end of cut. The blade can be mounted from the top in 30 sec. Motor mounting takes any 1/3 hp standard motor. *Kalamazoo Tank & Silo Co. For more information, check No.* 41 *on the postcard on p.* 35.

Portable Mixer

Reduction in labor costs and furnace downtime are claimed for a new portable multi-blade mixer with skip loader, designed for open-

D. A. STUART'S

ThredKut

Reduces Cost of Machining Spindle Gears by 50%

ROTATING barbed spindles in the International Harvester cotton picker are the mechanical "fingers" which pluck cotton in modern fields.

In cutting SAE 8640 gears for these spindles on Gleason Revacycles, a dilution of Stuart's THREDKUT 99 reduced oil costs by 50%.

On the spindle broaching operation, done prior to barbing, this same Stuart product is performing with excellent results. The spindles are C1117 steel, hardness 83 on the Rockwell B scale.

On standard or special operations you will find that Stuart cutting fluids plus Stuart service are the combination that will reduce your costs. Ask for literature.

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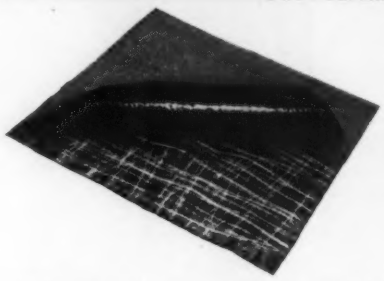

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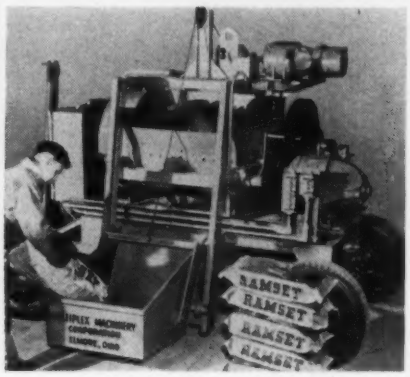
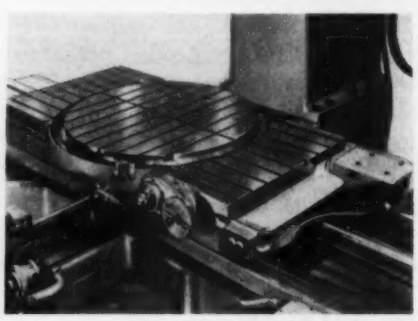
hearth refractory mixing. Mixes are completed in from three to four minutes. The machine consists of a Multiplex multi-blade mixer, mounted on a four-wheeled pneumatic tired truck. The unit is com-



plete with skip loader to facilitate loading the mixer, and is arranged on the carrier in such a manner that wheelbarrows can be located at the opposite side for receiving the mixed material. The machine is all steel construction. Drive of the mixer is through V belts. Mixers are available in 3, 5, 7 and 12 cu ft capacities. *Multiplex Machinery Corp. For more information, check No. 42 on the postcard on p. 35.*

Jig Borer Tables

A new design in jig borer tables features a large rectangular work area with ample T-slots for holding down work, as well as a precision built-in rotary table for circular indexing and polar co-ordinate work. The 48-in. diam circular surface is 1.000 in. higher



than the 36 x 78 in. rectangular surface to provide clearance when indexing work larger than 48 in. diam. As equipment on the No. 4E jig borer, the center of the rotary table is located 6 in. off center to the left in the rectangular table providing maximum rotary work range. Power rotation in either direction, controlled by pushbuttons, is provided for rapid indexing. *Pratt & Whitney, Div. Niles-Bement-Pond Co. For more information, check No. 43 on the postcard on p. 35.*

Test Sieve Shakers

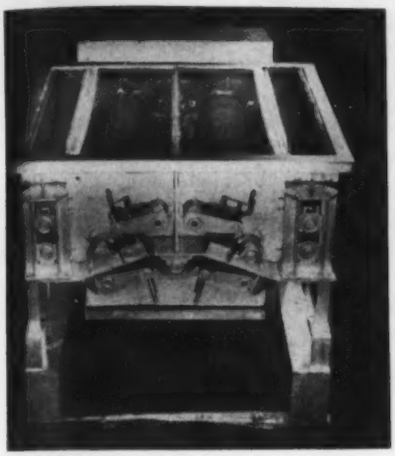
The vibrating action of a new test sieve shaker for laboratory screen analysis work is produced by the Syntron electromagnet drive energized by rectified, half-wave ac current, producing 3600 vibrations per min from 60 cycle. Amplitude of vibration is regulated by a rheostat located in the front of the base cabinet. A reset timer pro-

vides accurately timed test periods. The six 8-in. diam sieves in the shaker are simple and easy to place and remove. *Syntron Co. For more information, check No. 44 on the postcard on p. 35.*

Cleaning Strip Steel

Cleaning strip steel at the rate of 125 fpm after it has passed through a pickling or cleaning solution is possible in a compact brush box using stainless steel or fiber brushes that resist the corrosive effect of acids and water. These Heli-Master brushes are constructed of stainless steel wire in

stainless steel backing strip. The brush boxes, developed by W. S. Rockwell Co., are used on a continuous strip anneal and pickling line. They are made of stainless steel to withstand the corrosive effect of the pickling or cleaning solution



and the rusting due to water spray. Strip, either in a single broad width or a series of narrow strips, up to 60 in. total width, can be processed. While being brushed, the strip is continuously sprayed with water that carries the loose scale to the drain underneath the box. *Osborn Mfg. Co. For more information, check No.* 45 *on the postcard on p.* 35.

Pillow Blocks

Manufactured in ½, ⅝, ¾ and 1-in. bore sizes, the new Lubralife pillow blocks handle heavier loads and higher speeds than conventional bearings. A cavity filled with sponge iron acting as a wick, plus high porosity of the bearing

metal insures adequate lubrication for the life of the bearing. By impregnating the metal with a special lubricant, under pressure, filling the sponge iron section and the pores in the metal, the lubricant forms a thin, protective coating around the shaft without dripping. Perfect alignment is assured by the

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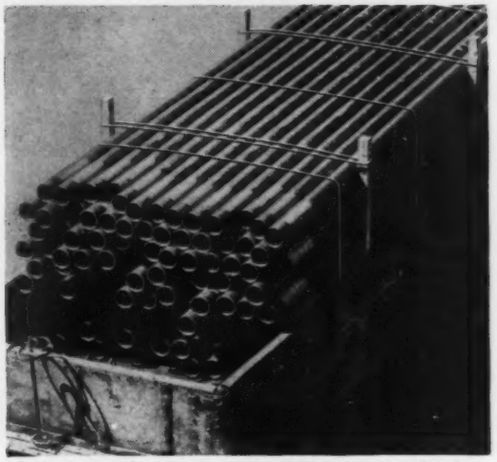

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Why not talk with a Gerrard engineer about your strapping problems? He will gladly explain the advantages of the Gerrard Strapping method, and why Gerrard Round Steel Strapping costs about 40% less than any other type of metal strapping. His services are available free of charge.

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UNITED STATES STEEL

For Greater **PRODUCTION EFFICIENCY SAVINGS**

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- Single and Multi-Spindle Honing
- Straight Line Multi-Drilling
- Adjustable Spindle Drilling
- Vertical and Way-Type Fixed Center Drilling, Boring and Tapping
- Special Multiple Operation Machine Tools

Our 50 years of Machine Tool Engineering Experience is at your service. Tell us your particular problem.

MODEL HU68 universal joint type driller performing core drilling, reaming and facing operation on forged steel parts.

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Weldimatic Welding Torch "W-46", with built-in automatic Gasaver. Time study in auto plants showed an average gas savings per man of $4.80 per day with this Weldit Torch. Weighs only 13 ounces. No operator's fatigue.

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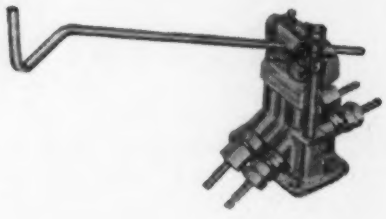
. . . has been in continuous use throughout the world for over 20 years — slashing fuel costs, lessening fire hazards and improving safety conditions.



Weldimatic Blow Pipe "C-47", with automatic shut-off fashioned of special aluminum alloy. Features lightness of weight and fine balance. For soldering, annealing and heating jobs. Uses natural or manufactured gas, butane, and other low temperatured gasses and compressed air.

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Made from high-grade alloy tool steels properly heat-treated of uniform high quality — may be purchased with complete confidence for maximum service.
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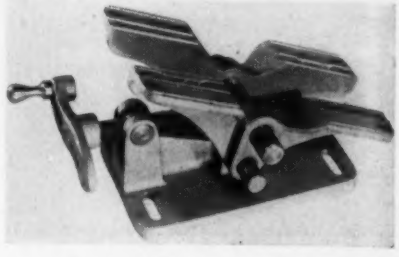
floating ball and socket construction of these pillow blocks. *Congress Drives Div., Tann Corp. For more information, check No. 46 on the postcard on p. 35.*

Tilting Motor Base

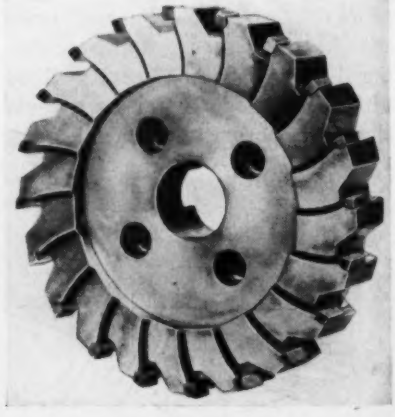
Designed for fractional horsepower motors, a tilting motor base weighs 10 lb and has reversible mounting brackets for versatility



of motor installation. A convenient handle provides effortless adjustment of motor to desired position. *Gerbing Mfg. Corp. For more information, check No. 47 on the postcard on p. 35.*

Face Mill

For milling cast iron rims and bosses, a new fine tooth face mill has double the number of teeth normally used in the conventional face mill, allows for extra tooth engagement and makes a smooth running



cutter. The solid extra heavy carbide tips sandwiched brazed with nickel shim and the alloy steel bodies make a rigid tool providing long cutter life. Sizes are 6, 8, 12 and 14 in. diam. *Nelco Tool Co., Inc. For more information, check No. 48 on the postcard on p. 35.*

Resume Your Reading on Page 39

To Your SPECIFICATIONS

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COLD ROLLED STRIP STEEL

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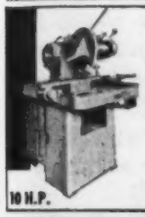

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They're *cut out* to *cutoff* bar stock and shapes

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GRAY, Originator of First Practical Metal Cutter or Nibbler. Received N.A.M. Pioneer Award.

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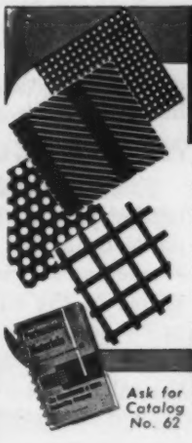

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Any Sheet Material

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LATE TYPE MACHINERY

BORING MACH., 5" Sellers, Late, Floor Type & two 3" No. 30 Univ. Triways
BORING MILLS, VERT., 84" & 72" Cinci.; 54", 42", 36" Bullard, spiral dr.; 42" & 36" King, side hd., '43 (2); 42" King, 2 rail hds.
BORING MILLS, HORIZ., 4" Univ., table, 80" vert., 96" hor., '43; 3½" Landis No. 35, floor; 3" Univ., table, 42" vert. x 72" hor., '43; 3" Yoder, table, '43; 2½" No. 25T G. & L., table, '42; Vert. Attach. for No. 330T Mill; 36" Ohio Sq. Rotary Table
CRANE, 30 ton Cyclops, O.E.T., 50' span, 5 ton aux., '43
DRILL, RADIAL, 6'17" col. Carlton, motor-on-arm
DRILL, 6 Spin. Allen, 15", #2 M.T., power feeds
GRINDER, SURF., 30" x 120" Hanchett Horiz. Spin., #12o Plane
GRINDER, SURFACE, 12" x 24" G. & L. No. 45, 1942
GRINDER, 20" x 72" Landis, Hyd., Cyl., AC, M.D.
GRINDER, 20" x 36" Landis Univ., Cyl., Hyd., late
GRINDER, 10" x 36" Norton, Hyd., Surface, 1943
GRINDER, No. 174 Heald, gap, int., 54" swing, 1942
GEAR GENERATOR, No. 61A Fellows, 1942
GEAR CUTTER, 36" B. & S., late
GEAR CUTTER, No. 13 B. & S., spur & bevel
LATHE, 60" x 45' cen. Mackintosh-Hemphill, 1942
LATHE, 50" x 58' cen. Amer., 3 carr., T.A., Late
LATHE, 50" x 26' cen. Amer., 2 carr., T.A., Late
LATHE, 50" x 26' cen. Amer., 1 carr., T.A., Late
LATHE, 48"-58" x 25' cen. Wickes, 1942
LATHE, 48" x 20' cen. Simmons, hvy., like new, 1942
LATHE, 38" x 32' bed N.B.P., 2 carr., T.A., M.D.
LATHE, 30" x 20' cen. Axelson, T.A., 34" sw., late
LATHE, 30" x 18' cen. Lehmann, T.A., 1943
LATHE, 14/18½" x 54" cc Monarch, 1945
TURRET LATHES, No. 1A & No. 3 W. & S., Univ., bar & chuck, late
MILLERS, HOR., Nos. 4K & 3K K. & T., plain
MILLER, HOR., No. 4B B. & S., plain, late
MILLER, HOR., No. 3 Cinci., dial type, plain, late
MILLER, HOR., No. 3H K. & T., plain (2), 1942
MILLER, HOR., No. 36 Van Norman, ram, 1943
MILLER, HOR., No. 3A B. & S. Univ., S.P.D.
MILLER, HOR., No. 2 Stand. K. & T. Univ., Timken
MILLER, HOR., No. 2G Kempsmith Univ., M.D. '43 (3)
MILLER, HOR., No. 2MH Cinci., plain, late (2)
MILLER, VERT., No. 4 Kempsmith Maxi-Mill
No. 9J Gerton Elec. Duplicator, '44
No. 2416 Keller 3 spin. Duplicator, late
PLANER-MILLER, 56" x 48" x 18' Ingersoll, 3 hds.
PLANER, 96" x 96" x 24' N.B.P., 4 hds., rev. M.D.
PLANER, FROG & SWITCH, 42" x 16" x 16' N.B.P. 50 h.p., M.D.
PLANER, OPENSIDE, 36" x 54" x 18' Cleveland, 3 hds
PLANER, PLATE, 30' x 1" Cleveland, M.D.
SLOTTER, 20-24" Dill, gear box, M.D.
STRAIGHTENING ROLLS, 10' x ¾" Pope, 7 roll, 42
BENDING ROLLS, 18" x 1¼" N.B.P. pinch, 65 ton

BENNETT MACHINERY CO.
30 CHURCH ST., NEW YORK 7, N. Y.
PLANT—Clifton, N. J.
CABLE ADDRESS—Benmachine, New York

LATE TYPE MACHINE TOOLS

16" 6 Spdl. Bullard Muir-Au-Matic. 1941.
No. 42 Lucas Horiz. Boring Mill. 1940.
5' 15" Cin.-Bick. Radial Drill. 1942.
No. 645A3, 615A & 61A Fellows Gear Shapers. 1944.
16" & 36" Cincinnati Plain Hyd. Grinder. 1942.
72" Thompson Hyd. Broach Grinder. 1941.
45" x 192" Axelson Engine Lathe. 1942.
36" & 42" Bullard Vertical Turret Lathes. 1943.
No. 3-36 Cincinnati Duplex Milling Machine.
No. 3B P&W Univ. Die Sinker. 1943.
No. 40-5½ Minster Straight Side Press. 1942.
150 KVA Federal Seam Welder. 1943.

INDIANAPOLIS MACHINERY & SUPPLY CO.
1983 S. Meridian St.
INDIANAPOLIS 6, IND.

THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Users keep machinery prices high by outbidding dealers at auction sales

Divided opinions expressed on benefits of shorter depreciation periods

Some fear machine dumping; most feel new-used price relations will continue

Users Attending Auction Sales Help Maintain Machinery Prices

Cleveland — Auctions are continuing to bring high prices for good machines. For the average dealer, established contacts in plants remain the prime source of supply. Dealers find that users attending auctions or sending authorized representatives, sometimes their dealers, are helping maintain the price on good machines.

Dealers Increase Advertising

In an effort to stimulate sales, dealers are now doing more advertising than they have at any time since the war ended.

Some dealers see new machine sales as the principal cause of their declining sales volume. Others venture the guess that small shops, the principal buyers of used machines in the Cleveland area, are either getting a little short of money or waiting to accumulate sufficient funds to buy new machines.

One dealer reports that his business for the first quarter would be off only 15 pct from the first quarter of last year. Other dealers indicated that their drop in volume has been more substantial.

Cleveland Market Competitive

The Cleveland used machinery market is in a period of stiff competition. A few dealers are overstocked and trying to unload. This is one of the chief factors in the price softness on certain items.

Another factor in the market is the rebuilding programs that have been announced by certain machine tool builders, including Warner & Swasey Co. here. Dealers who rebuild are affected particularly by this move.

Tool room machines and sheet metal forming equipment led the used machinery market in Cleveland for the past few weeks. Production equipment and older machines of nearly every type are in easy supply, but prices are tumbling fast on these items, according to representative segments of the trade.

The undertone of the used machinery market indicates that small plants and shops have a firm and continuing interest in improving their machinery. How far this will develop depends on how the small shops make out in the next quarter.

Divided Opinions Expressed On Shorter Depreciation Periods

Philadelphia — The opinions of machinery dealers are sharply divided on the merits of shorter depreciation periods for capital equipment. If and when the government authorizes a shorter write-off for capital expenditures, there will be a severe dislocation in the used machinery market, some dealers believe. These dealers say that buyers of used tools will expect to be able to buy machinery written off in a period of three to five years for virtually nothing. They consider that once the investment is written of, the owner will be glad to sell the equipment at a low price to have it removed from the plant.

Turn to Page 164

AARON FOR RELIABILITY

AUTOMATICS
Brown & Sharpe #00G, H.S. #4 & 6
Brown & Sharpe #2G, 1½" cap.
Conomatic 8 sp. 1¾" cap.
New Britain Gridley 8l—2¼" 6 sp.
Cone ⅝" Swiss type

BORING MILLS
Giddings & Lewis #8, #25T
Lucas #31 horiz.
Universal 3" horiz. equipped
Bullard 42" V.T.L.

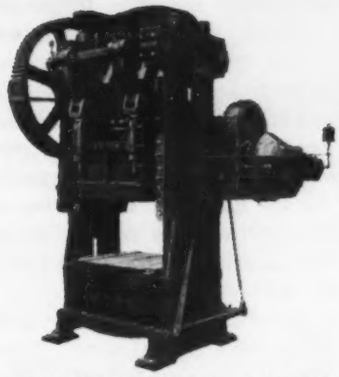
DRILLS AND RADIALS
Allen 6 spindle
Cincl-Bickford Sup. Ser. 21"
Royersford Excelsior 21"
Canady-Otto 3'-9" col.
Carlton 8'-19" col.
Sibley 24" & 28"

ENGRAVERS
Gorton #3U, 2 dimensional
Gorton Cutter Grinders 375-2, 265-6
Deckel GKI 3 Dimensional

GEAR EQUIPMENT
Barber-Colman #3 Hobbers (3)
Gleason 3" Generator
Hamilton Hobber
Fellows 645Y, #7, #72, #725 High Speed Shapers
Mikron Gear Hobber
Fellows, Michigan, Gleason Checkers

GRINDERS, MISCELLANEOUS
Brown & Sharpe #5 cyl., 3" x 18"
Brown & Sharpe #1, #2, #3 Univ. #13 Tool
Cincinnati #2 Centerless Filmatic, 12 x 36 Univ.
Cincinnati #2 Tool & Cutter, univ.
Cinn. 12 x 48" Univ., Gardner #226, 30" disc.
Covel #91A Univ. Tool & Cutter, Hammond #4
Heald 72A3 Int. Centerless Sizematic, #1 Tool
J. & L. TG636 Thread Grinder
Landis #4H Cyl. 4x12", Centerless, #6 Thread
Norton #2 Tool & Cutter, Type C, 8x30"
Oliver #510 Drill Pointer, Sellers 4G, Black D'mond
Pratt & Whitney Radius #R6, K.O. Lee Tool
Porter Cable Belt WG8, G8; Grenby Int.

GRINDERS, SURFACE
Abrasive #3B, 8x24", #33, #34 Vert.
Blanchard #16, 30" Mag. Chuck, #11—18" chuck
Brown & Sharpe #2
G. & L. #25, #35 Hyd. Feed, 6 x 18, 8 x 24



Bliss 406-48" Dbl. Crank, Dbl. Action Toggle Press

Hanchett 300 series, 13x48" with chuck, Hammond #2
Norton 6x18" Hyd., Atlantic 6x18" Power Feed
Reid #2A P.F. MIB., #2C Pope Spdl.
Pratt & Whitney 12x36" Vert.
Thompson Hyd. 6x10x19", 6x12x18"

LATHES
Hardinge Precision 9", 1" Collet Cap., Rivett
Hendey G.H., 16x30", Rel. Att. Bradford 14"x6'
LeBlond Regal 15x30", 21x60", 10"x3½', 19x48"
LeBlond Heavy Duty 16x33"
Lodge & Shipley 16x78" T.A., Collets, etc.
Monarch 10"x20" EE, 16x78 G.H., 12x30"
Sebastian 12"x4' G.H.
Sheldon 11"x24", Logan 10"x30"
South Bend 13x36", 14½"x6', 10x4, 9x3, 9x3½

MILLS, PLAIN, UNIVERSAL & PROD.
Brown & Sharpe #000, 12, 21, #2A Univ., 2B PL.
Burke #4 Plain & Univ. Vert. Hd.
Cincinnati 2MH Univ.—I-12, I-16, 2-18 Mfg.
Kent Owens #1V; U.S. Hand Mills
Milwaukee #2HL, 2H Univ., 2H Plain
U. S. Multimiller
Sundstrand 00 Rigidmill; Whitney Hand Mills
Van Norman #12, 22L, 36; U. S. 1 & 2 sp.

MILLS, VERTICAL
Bridgeport Vert. Slotter, Hor. Sp.
Brown & Sharpe #2
Cincinnati #4
Foodick Jig Borer #42A, HD. Equipped
Gorton #8D, 9J Plain, 8½D Duplicator
Sip Jig Borer #MP-5
Index, Jackson, Vernon
Milwaukee 3H, H.S.D.T.
Morey #12M Profiler 2 sp., P. & W. 12B

PRESSES
Bliss 675, 850, 845B Hi-Production Presses
Bliss #8 Dbl. Crank, Bed 42"x96"
Bliss 19, 29, 21 OBI, 58, 62, 62A, 162 OB.
Bliss #4½ Double Action, Roll Feeds

HYDRAULIC EQUIPMENT

Cap.	Manufacturer	Platen	Stroke	Opening
550	Southwark	42x32"	28"	68"
500 Ton	Lake Erie	35x36"	36"	66"
800	Bald.S'thw'k	76x59"	22"	30"
500 D.A.	H.P.M. (160 Cushion)	36x36"	24"	36"
300	Brand New Watson Stillman Hobbing Press			
50	Dennison	22x20	18	23
150	Southwark	84x30	30	2' to 4'

UP MOVING RAM PRESSES

150 and 100 Ton Stokes Molding Presses & Pumps
300 Ton Dunning & Boschert Molding Press
500, 800 Ton Waterbury-Farrel 3 & 4 Rod Presses, 6 & 8½ strokes
300 Ton Watson Stillman Press, 24x20" Platens
500 Ton Shaft Straighteners—Self Contained

All Hydraulic Equipment is completely engineered and checked by a competent staff, thus assuring reliability. Send us your Hydraulic problems.

NEW IN STOCK
Air Hydraulic Presses—Arbor Presses #8C Famco—Band Saws Kalamazoo—Drill Presses all sizes—Hydraulic Press Northern 20 Ton—Injection Molders, 1 ounce—Power Presses, OBI, 4½, 5, 7½, 10, 12, 18, 30 ton—Shaper, 7" Amco, 8" Shaperite—Shaper, Sheldon 12"—Shears, Foot 22" to 8', 16 & 18 ga.—Shears, Power, 3'x18 gauge to 10'x19 ga.—Welders, Arc, Seam, Spot all sizes—Vert. Milling Attach. Haloo H.S.—Motors, Grinders, Buffers, all sizes.

Henry & Wright 75 Ton Dieing, 25 Ton
Z & H 30 Ton OBI
Toledo 400 Ton Knuckle Joint
V. & O. #102 O.B.I. Reducing

TURRET LATHES
Acme #6W Bar & Chuck, Acme 6W Fex. 4W
Bardons & Oliver #3, 1½" cap., #5, 2" cap.
Brown & Sharpe #1, 2F, Hand
Gisholt #4, 5 Bar & Chuck, 1L, Foster #3B
Hardinge ESM Second Operation
J. & L. 8A—Well Tooled
Oster #60i Rapiduction, well tooled
Warner & Swasey #5, 4, 3, Universal
Warner & Swasey #4A, 8" cap. Power Chucks (2)

MISCELLANEOUS
Band Saw; Tannewitz #36M, DoAll ML, V16
Bending Roll; Buffalo #0, ½WR, Excelsior #14
Broach; American Horiz. Hyd. Model H-15-60
Hacksaw; Marvel 6A Automatic #6
Hardness Tester; Clark
Hener; Micromatic #H-1, Sunnen
Keyseater; Davis, Baker, M & M
Riveters; HI Speed
Router; Onsrud #W240, 55
Saws; Wells, Catskill, Peerless, Kalamazoo
Slotter; P. & W. 6" Vert. Shaper
Shaper; 8" Shaperite, 7" Atlas
Shear; Pexto 6"x14 Ga.
Tappers; Bakewell #1, Haskins #2C, 3C
Welders; Seam & Spot; Thompson, Taylor-Winfield, Sciaky

This is but a partial listing. Write for free Catalog. Inquiries invited.

AARON MACHINERY CO., Inc., 45 Crosby Street, New York 12, N. Y.
"CABLE—AARMACH N. Y." Telephone WOrth 4-8233

EXCELLENT BUYS

20" x 72" cc LODGE & SHIPLEY Toolroom Lathe, 1943, taper, pan bed, coolant system, 2 face-plates, chuck, AC motor. Price, $5950.00.

2L GISHOLT Turret Lathe, new 1941, preselector head, bar feed, collets, hardened ways, taper attach., AC motor. Price, $5850.00.

10 ton—54" stroke FOOTE-BURT Vertical Surface Broach, new 1941. Price, $2750.00.

O'CONNELL MACHINERY CO.
1821 Niagara Street Buffalo 7, New York
BEdford 8500

5" Sellers FLOOR TYPE Horizontal Boring Mill
#30 "Tri-Way" Universal Horizontal Boring Mill, 3"
#33 Lucas 4½" bar Horizontal Boring Mill
#61-A Fellows Gear Shaper
6'-17" Carlton Radial Drill
48" x 48" x 17' Powell Planer, 4 heads

HAZARD BROWNELL MACHINE TOOLS, INC.
350 Waterman St., Providence 6, R. I.

BENDING ROLLS

H. & J. 30' x ¾" Pyramid.
Southwark 15' x 3" Pyramid, Vertical (Can convert to Horizontal).
Bertsch Angle Rolls 3" x 3" x ⅜".
Plate Edge Planer 32' x 2".

Kings County Machinery Exchange
408 Atlantic Ave., Brooklyn 17, N. Y.
Phone TRiangle 5-5237—Dept. "I"

FOR SALE
ALLEN TYPE KH DRILLS
(3) ALLEN FOUR SPINDLE TYPE KH DRILLS. PRICE ..... $1,250.00 ea.
(2) ALLEN SIX SPINDLE TYPE KH DRILLS. PRICE ..... $1,650.00 ea.
#2 Morse Taper, ⅝" Drilling Capacity, Hand Feed to Spindle. 1942 MODELS PRACTICALLY NEW

WINSTON MACHINERY CO., INC.
317 South Delaware Street Indianapolis 4, Indiana

BL-2420 Keller (P&W) 3 dimen., 3 spin. (1942)
#4 Medart Bar Turner, 4½" Capacity
30' x 1" Cleveland Plate Planer
3L Gisholt Turret La., Hard. Ways, Chuck

ROSENKRANZ, WEISBECKER COMPANY
149 Broadway New York 6, N. Y.

MILLING MACHINE

No. 3 Cin. Dial Type, plain, motor 3/60/220-440 in base, with vertical head, slotting attachment, vise, 3 arbors. Ser. 4A-31L-72. Excellent. Price $6000.00

GALBREATH MACHINERY CO.
Empire Building Pittsburgh, Pa.

AIR COMPRESSOR

1000 Cu. Ft. Worthington "Feather Valve," 18" x 11" x 14" two stage with 185 HP synchronous motor on shaft.

AUTOMATIC

4⅜" Conomatic 4 spindle, serial No. 2191K with, reel, chip conveyor, extra equipment.

BORING MILLS

4½ bar Lucas No. 33. Table 46" x 64" Max. height 36", Max. to outboard support 11".

100" Niles Bement Pond. Extra heavy type. 2 swivel heads, power rapid traverse, 35 HP direct current motor.

BROACH

15 ton 36" stroke American vertical duplex surface with tilting type workholder.

DRILL

42 spindle, No. B16 Natco multiple with 18" x 48" drilling area and two box tables.

GEAR HOBBER

Type T Barber Colman. Designed for either straight or taper splines, helical or spur gears. Also type A and Nos. 3 & 12 Barber Colmans.

GRINDERS

6" x 18", No. 10 Brown & Sharpe "Electric Hydraulic" Three with and two without spindle oscillation. New 1940 and 1941.

10" x 36" Norton type C hydraulic with hydraulic quick in-feed. Serial No. C16458, new in 1942.

10" x 72" Norton type C hydraulic made at factory to swing 14". Serial No. 21750, new in 1944.

23" x 36" Norton type C with mechanical table traverse, hydraulic quick in-feed. Serial No. C18281, new 1943.

LATHE TURRET

No. 2FU Foster Fastermatic Serial No. 2FU529, new in 1944. Quite a little tooling.

MILLERS

Cincinnati Hydromatic Sizes: 3-24, 34-36, 4-36, 4-48, 5-48, 56-72 and 56-90.

PRESSES

1000 ton, No. 666 Toledo knuckle joint Coining. 2½" stroke, 18" shut height, bed 37" F to B x 31" R to L.

350 ton Clearing Crankless, model F1350-42, serial No. 45-11155P, new 1945. 20" stroke, 28" shut height, 36" x 42" bed.

600 ton Hamilton No. 2316½ eccentric shaft forging. Stroke 4"; shut height 16" bed 28" F to B x 23¾" R to L.

No. 506 Bliss on inclined legs with double roll feed and scrap cutter. About 126 tons. 3" stroke, 11½" shut height.

1000 ton Baldwin Southwark "Hy-Speed" hydraulic. 20" stroke, 56" daylight, bed 42" F to B x 54" R to L.

UPSETTERS

2" National. Serial No. 13213. Has suspended slides with long overarm guide. Has 15 HP motor.

4" Ajax. Serial No. 3156. Has twin drive gears, suspended slides, self contained backshaft, 30 HP motor.

MILES MACHINERY CO.
SAGINAW, MICH.

Continued from Page 160

The main body of dealer opinion holds to the view that supply and demand will continue to control the market, even with short term write-off provisions. Competition is expected to continue to keep prices for good used machinery in a reasonable relationship with new equipment. There is expected to be no dumping of written-off machinery, and no serious threat to the stability of the used equipment market.

In general, the tone of the dealer trade here is optimistic. There are many new buyers in the market, educated to look into the used machinery market by the good values offered by WAA after the end of the war, and deterred by high prices from buying new machinery now.

Tools older than 1940 are not being generally sought after now. Exceptions are some of the very heavy items. Older machinery sells at sizeable reductions from the present prices. Present prices on good, late type equipment range from 50 to 60 pct of new machinery prices. There is very limited interest in the older equipment. Very often equipment within the 10-year period is sold at prices equal to the original cost.

NISA Group Hears Talk on Sales

Chicago—Les. A. Thayer, sales manager, Belden Mfg. Co., presented the first of the slide films, Selling Against Resistance, at the meeting of the Central District chapter of the National Industrial Service Assn. on Mar. 14. It is Mr. Thayer's contention that the temporary slumps affecting business can be overcome by concentrated sales effort.

Regional NISA Conference Set

Washington—Richard Harris of Harco Equipment Co. presided at the Mar. 27 meeting of the Washington, D. C., chapter of the National Service Assn. at the Burlington Hotel. Plans were made for an eastern regional conference to be held at the Mayflower Hotel on Jan. 19, 20, 1951.

Resume Your Reading on Page 161

5" UPSETTERS

5" National High Duty Upsetting & Forg. Mach. Air friction clutch; side shear; auto. lubricating system; jib crane; 60 H.P. motor; V-belt drive

5" Ajax Heavy Duty Air Friction Clutch Upsetter; underarm header and grip slide; jib crane; 40 H.P. motor; V-belt drive

Upsetting & Forg. Machs., National High Duty, guided overarm heading slide, suspended slides, 1½", 2", 3", 4", 5"

Ajax & Acme Upsetting & Forg. Machs., not suspended slides, ¾", 1", 1½", 2½", 3"

W. W. Bulldozers, #22, #4, #24, #5, #8

Drop Hammers, 800# to 2500#

Nazel Air Forg. Hammer, #6B, Cap. 7" sq.

Bradley Hammers, Cushioned Helve, Upright & Compact

Trimming Presses, #59¼ Toledo, Tie Rod, 440-tons; other trimmers 55 to 200-ton

Bar Shears, Open & Guillotine, ⅝" to 7" Rd.

Minster 88-ton O.B.I. Press

Minster 88-ton S.S. Press, 16" stroke

Solid Back Presses, 20 to 100-ton

#94-A Toledo S.S. Double Crank, Tie Rod Press; bolster 40x36"

Bliss Knuckle Joint Press, 250-ton

Cleveland EF Sgl. End Punch, 48" throat, 1¼" thru 1"

Single & Double End Punches, various throat depths and caps.

L. & A. Multiple Punch, 8', 150-ton

L. & A. Multiple Punch, 10', 350-ton

Ryerson Serpentine Throatless Shear, ½"

#416-C Niagara Circle & Slitting Shear, ¼"

Flanging Machine, McCabe, cap. ¾"

Bertsch Straightening Roll, 1"x68"

Ryerson Friction Saws, #0, #1 & #3

Landis Threading Machine, 1", 2-Sp. lead screw, Lanco Hds., M.D., single up to 4"

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, COLD BOLT TRIMMERS, THREAD ROLLERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES, POINTERS, THREADERS, WOOD SCREW EQUIPMENT.

Diamond Face Grinder, Segment Wheel 36", Table 84"x24", Hydraulic operated

Landis Motor Driven Pipe Threader, 8"

American Wheelabrator, 36x42"

Southwark 400-ton Wheel Press

DONAHUE STEEL PRODUCTS CO.
1913 W. 74th Street, Chicago 36, Ill.

LATHE—BRIDGEFORD, 32" x 21' C. to C. (old)
LATHE—GUN BORING, 64" x 65' (late)
PLANER—GRAY, 60" x 60" x 40' (Tolerance .003)
PRESS—TOLEDO, #185, 1440 tons, D.A.
SHEAR—R. D. Wood, 7' x 1", 18" gap

MAXWELL MACHINERY CORP.
1775 Broadway New York 19, N. Y.
PLAZA 7-3471